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DEPARTMENT OF ENERGY AUTHORIZATIONS FOR FISCAL YEARS 1986 AND 1987

ORIGINAL

OVERSIGHT HEARINGS

BEFORE THE

SUBCOMMITTEE ON
ENERGY AND THE ENVIRONMENT

OF THE

COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS
HOUSE OF REPRESENTATIVES

NINETY-NINTH CONGRESS

FIRST AND SECOND SESSIONS

ON

DEPARTMENT OF ENERGY AUTHORIZATIONS FOR FISCAL YEARS 1986 AND 1987

HEARINGS HELD IN WASHINGTON, DC
MARCH 5, 1985 AND FEBRUARY 7, 1986

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DEPARTMENT OF ENERGY AUTHORIZATIONS FOR FISCAL YEARS 1986 AND 1987

TUESDAY, MARCH 5, 1985

House of Representatives,
Subcommittee on Energy and the Environment,
Committee on Interior and Insular Affairs,
Washington, DC.

The subcommittee met at 10 a.m. in room 1324 of the Longworth House Office Building, the Honorable Morris K. Udall (chairman of the subcommittee) presiding.

The Chairman. The subcommittee will be in session.

Today the Subcommittee on Energy and the Environment will receive testimony regarding the Department of Energy's budget request for fiscal years 1986 and 1987.

This year the Department is asking a total of $2.6 billion for programs within the jurisdiction of this subcommittee. This compares with figures of $2.3 and $2.9 billion, representing the total of funds appropriated in fiscal years 1985 and 1984.

The subcommittee's attention this year will inevitably be drawn to critical decisions being made in the DOE programs of highest importance to us. Three sites are scheduled to be recommended for characterization for possible development as the first deep geologic disposal facilities for high level nuclear waste. Another waste management concept, the Monitored Retrieval Storage [MRS] facility, will come up to Congress for review in the form of a Department of Energy proposal. In the Uranium Enrichment Program, the choice will be made between two promising new technologies for future enrichment capacity. It is to be hoped that the precise need for and proper timing of new capacity will be made clear in the process of the technology and program review.

The budget implications of the nuclear waste and uranium enrichment decisions involve many billions of dollars over the next decade. The direct impact of these program costs will be borne primarily by the consumers of nuclear generated electricity. The decisions will also directly affect the future of major American economic institutions. A reliable, high-level Waste Disposal Program is essential to the continued public acceptance of commercial nuclear power, and an efficient, competitive Uranium Enrichment Program is a foundation of a multibillion dollar domestic enrichment industry involving thousands of skilled jobs and significant foreign trade.

The uranium enrichment industry may also have a crucial bearing on the viability of our domestic uranium mining and milling industry through its effect on uranium supply and demand.

As the new Secretary of Energy attempts to take hold of these programs and steer us through these important decisions, I am concerned that he understand the enormous impact that secretarial leadership could have. I would urge the new Secretary to become quickly familiar with the important policy and programmatic decisions coming up and be certain that they are consistent, cost effective, and thorough.

I would like to bring to the Secretary's attention another issue which I think exemplifies what can happen if all apparently desirable and bureaucratically logical activities are carried on without strong, clear, and sensible planning. The DOE budget request for fiscal years 1986 and 1987 includes $22 million for transportation and systems integration and $12.9 million for monitored retrieval storage activities. Although it is not clear in the Agency's budget documents, based on internal planning documents, both of the programs seem to involve construction of storage capacity for nuclear spent fuel which are potentially expandable into facilities costing several billion dollars and capable of handling as much spent fuel as the high-level waste repository, which we are also spending multibillions of dollars to develop.

While the duplicative nature, scope, and cost of these programs should be looked at closely, it is also questionable whether the activities being planned are appropriate at this time, even assuming one or the other of these facilities might at some point be desirable. No MRS facility or any other facility to store more than 1,150 metric tons of spent fuel has been authorized by Congress, yet hardware procurement and preparation of environmental impact statements for construction of these facilities are planned for the next fiscal year.

I hope the Secretary will be aware that the Federal responsibility for interim storage has been and will continue to be a highly divisive and hard-fought issue in the Congress. The proper role of storage and the timing for bringing on this capacity, should that be needed, have profound implications for the waste program.

Great effort will be needed for development of consensus on MRS and storage issues and I predict it will not come together in the immediate future. Certainly, it should not be expected prior to approval of the fiscal 1986 budget.

Mr. Secretary, I should say you'll be greatly constrained in your attempts to manage the Department and the enrichment and waste programs by the political and statutory framework in which you have to operate. At the same time, we expect that you will be able to step outside those tangled webs and give us realistic, independent, and informed leadership and advice.

Within the existing framework of policy, there is substantial margin for judgment, and you should be ready and willing to exercise it clearly and openly.

I often point with pride to the Nuclear Waste Policy Act and the old Alaska Natural Gas Pipeline Act as examples of how leadership can set a course for a difficult project and get people together to get decisions made through a lot of unofficial negotiating and jawboning. We have set up similar kinds of processes for the Uranium Enrichment Services Program. I like these targets. I like action and projects that stay on track. But let's remember the other lesson from the Alaska Natural Gas Pipeline, which is that you can meet all the target dates on schedule and get all the decisions made and find that everything worked fine, but you don't have a train behind the engine when you get to the end of the line.

So we'll depend on the Secretary and officials and other administration officers, not only to stay on track but to remember where we're going and what to do when we get there.

With this in mind, we'll hear this morning from Secretary Herrington. Afterwards, we'll get an independent overview of the High Level Nuclear Waste Program from Mr. Kevin Boland from the General Accounting Office.

Secretary Herrington, this is your first appearance as Secretary before the Interior Committee. We're pleased to have that honor of hosting you here this morning. We'll be glad to hear from you. If you'll hold just for a moment, Congressman Seiberling has an opening statement.

Mr. SEIBERLING. Mr. Chairman, I appreciate this. Let me take a few minutes to make some opening remarks.

In the next several months, the DOE must make many critical decisions regarding the future of the Uranium Enrichment Program. I am very concerned about the outcomes of these decisions and the structure of the decisionmaking process.

In May of this year, DOE is scheduled to decide which of two advanced technologies it will choose to develop for future deployment by the uranium enrichment enterprise. The advanced gas centrifuge technology is a further refinement of the centrifuge machines currently being installed at the Portsmouth, OH facility; and the competing Avlis laser method is a new technology which has never been tested under actual production conditions. The Department has created a special Process Evaluation Board to help make this crucial decision between the two competing technologies. I hope today we'll hear more about how this Board was selected and how it is going about making its recommendations.

I am very concerned that DOE not let this May decision deadline slip. Any delay in the commitment to the deployment of a new technology could seriously reduce DOE's ability to obtain a significant share of the world enriched uranium market or to retain its present share. I see very little benefit in delaying this decision. The Department's customers need to know what its future plans are in order to maintain their confidence in the ability of DOE to deliver its product at a reasonable price, and the companies involved in developing the advanced technology need to know where to commit their personnel and other resources to those companies, three of which are located in my own State.

I urge the Department not to slow the deployment schedule for whatever technology is chosen in May. The United States should not rely totally on the continued use of the aging gaseous diffusion plants, if we are to remain competitive in the world market. These plants use enormous amounts of electricity to enrich uranium. The Department should be encouraging energy conservation. Technology will soon be available which uses much, much less energy than the gaseous diffusion method. It makes little sense for the DOE to refuse to deploy the new technology as soon as possible. From a sound business standpoint, total reliance on the gaseous diffusion plants is quite risky, because it assumes that the future price of electric power will not increase dramatically due to energy shortages or unstable world political conditions.

I think DOE should move as quickly as possible to deploy an advanced technology, and they should start commercial production from the centrifuge machines already installed in the Portsmouth, OH plant. The Department should not allow a $2 billion investment to sit idle when it could be saving electricity by using the centrifuge plant to produce enriched uranium.

I am also troubled by a recent DOE decision to delay for 2 years the deployment of the advanced centrifuge technology, if that method is chosen in May. The 2-year gap will make it very difficult for the private companies involved in centrifuge research and production to maintain viable production teams with the necessary skills and expertise. People and private companies cannot be turned off and on arbitrarily. I am afraid that unless DOE makes wise decisions in the next few months, it may lose its industrial base as companies drop out of the program.

The delay in deployment will also significantly increase the total costs of the Advanced Centrifuge Program, if it is selected. While there may be compelling reasons for such delay, I would point out that the resultant increase in costs tends to tilt the selection process. I think that our committee should continue to carefully modify all DOE's decisions concerning the Uranium Enrichment Program, to ensure that these decisions are sound from both a technological and a good business point of view.

Thank you very much, Mr. Chairman.

The CHAIRMAN. Does the gentleman from Idaho have a statement?

Mr. CRAIG. Thank you very much, Mr. Chairman.

Secretary Herrington, we're pleased to have you before the committee this morning. I think the chairman and the gentleman from Ohio have outlined some of the concerns that this committee will be involved in. I have not always been a friend, and I've oftentimes been a critic of the Department of Energy. I will remain so, as the operations continue, because of the basic feeling that we've survived in spite of ourselves, especially when the marketplace operates as well as it does in the field of energy and energy supply for this country. We are in a much better position today, not because of our Government and not because of the Department, but because of the market.

I think that although there is a place inside the Federal Government where we can do research projects that oftentimes are outside the scope of industry, it still is a question in my mind as to whether you should exist. And I will look at you from that perspective.

Thank you, Mr. Chairman.

The CHAIRMAN. I told the Secretary we'd give him a kind welcome. Already he's been questioned about his existence. [Laughter.]

Mr. CRAIG. Mr. Chairman, that was intended entirely to be kind. [Laughter.]

I think it would be very kind if he no longer existed.

Mr. SEIBERLING. He looks pretty real to me.

The **Chairman**. Any more friendly or unfriendly opening remarks? The gentlewoman from Nevada.

Mrs. **Vucanovich**. Thank you, Mr. Chairman. May I just try and make Mr. Herrington feel welcome. We are very happy to see you and very happy you're going to be here to answer questions, and also, Mr. Rusche, whom I've met with several times. As most of you know, my State is concerned about what you're going to be doing with the waste depository.

I just want to welcome you.

The **Chairman**. Before the Secretary begins, let me say to our guests who are standing, that we have this lower level of seats with perhaps a dozen chairs, if anyone wants to come forward. We'll make you honorary staff members. [Laughter.]

I always like to have the taxpayers sitting down. [Laughter.]

Mr. Secretary, you may proceed.

[Prepared statement of Hon. John S. Herrington may be found in appendix I.]

STATEMENT OF HON. JOHN S. HERRINGTON, SECRETARY OF ENERGY, ACCOMPANIED BY JAMES VAUGHAN, ACTING ASSISTANT SECRETARY FOR NUCLEAR ENERGY AND BEN RUSCHE, DIRECTOR, OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

Secretary **Herrington**. Thank you, Mr. Chairman. In your invitation to us to testify here today, there was a request for a number of questions to be answered. We have these answers here for the committee today. They were difficult questions, and we spent a lot of time on them. I hope the committee will accept my apologies for not having them here within the 48-hour rule. I wanted to personally review the answers. I hope in the future we'll be able to be a little more forthcoming.

The **Chairman**. We'll be glad to have these for the record. They will be made a part of the record in full. It's often a healthy exercise. If we have to think up the questions and you have to ponder the answers, the policy may get a little more attention.

[**Editor's note**.—A series of prehearing questions submitted by the subcommittee to the Department of Energy may be found in appendix I, with responses. See table of contents for page number.]

Secretary **Herrington**. As you stated, this is my first appearance before a House committee. I've been on the job approximately 2½ weeks. I found these issues very challenging, but on the subjects we're discussing here today, contracts in the Government and the nuclear waste policies, I felt it necessary to bring along today Mr. Ben Rusche, the Director of our Nuclear Waste Program, to supplement any answers I might give.

Mr. Rusche, I have found to be one of the most outstanding administrators I've met in my last 4 years in this Government and I think he's done a great job in a very difficult area.

Also with me, I'd like to introduce James Vaughan, Acting Assistant Secretary for Nuclear Energy, and behind me, Assistant Secretary Martha Hesse Dolan, the head of our management and administration who has numerous books of numbers, should you care to discuss numbers. Finally, her deputy Betty Smedley, whom

I found to be an extremely competent career employee of the Department of Energy.

With that I'd like to make a few opening remarks. I do have a statement I submitted for the record. At my request I would hope the committee would include it as part of the record.

The CHAIRMAN. Without objection, it's included as part of the record.

Secretary HERRINGTON. I'd like to discuss a couple of general items. First, the current energy situation which is why we are having this hearing. I'm pleased to report that the energy situation facing this Nation today is very encouraging. Over the past few years there's been a dramatic reduction in petroleum imports. In 1977, we were importing 46 percent of the total U.S. consumption. Now, in 1984, we are importing 29 percent. In addition, the probability of a severe oil supply disruption is much lower today than it was in the 1970's. Our worldwide dependence on oil from the Persian Gulf has declined and today there is excess worldwide oil production capacity of about 10 million barrels a day.

We also have made significant gains in conserving our energy resources. The total energy consumption in 1983 was actually less than that of 10 years earlier while the economic output of this country over the same period of time has dramatically continued to expand.

The news is good but we should not become complacent and it will be the goal of the Department of Energy to take full advantage of this absence of a supply crisis to develop a mix of energy supply and end use technologies that will lead to energy security.

Taking our budget overview, the fiscal year 1986 budget of the Department of Energy was developed with two objectives in mind. One, to continue our progress toward a goal established in our fourth national energy policy plan of achieving an adequate supply of energy at a reasonable cost; and two, to contribute to Governmentwide efforts to reduce the deficit by limiting Federal expenditures.

The budget succeeds in meeting both objectives. It continues the program strategy of seeking a balance, mixed energy resource supply while supporting promising avenues of research in a wide variety of technology areas while making a substantial contribution to the deficit reduction.

The fiscal year 1986 budget that we are proposing is almost 12.5 billion dollars. That is approximately $1.9 billion less than we had in fiscal year 1985. Most of this reduction in the 1985 appropriated level results from a decision to impose a moratorium on further development in the filling of the strategic petroleum reserve.

I'd like to discuss selected major programs of interest to this Committee.

First, I'd like to discuss the nuclear waste fund programs. The Nuclear Waste Policy Act of 1982 mandates a comprehensive set of Federal activities directed by the Department that are designed to begin with the operation of a Federal waste management and disposal system capable of accepting spent nuclear fuel and high level radioactive waste from commercial nuclear power reactors by 1998.

Our fiscal year 1986 budget presents an integrated picture of a total waste management system to finance the activities related to the development and construction and operation of a waste disposal system. The act established the Nuclear Waste Fund. The main source of revenue for this fund is a fee payment from nuclear utilities, for nuclear generated electricity. The fiscal year 1986 request for budget authority financed by this fund is $571.5 million.

Major accomplishments have been made since the enactment of the Nuclear Waste Policy Act. On December 20, 1984, DOE issued draft environmental assessments on nine sites previously identified as potentially acceptable for geologic repositories. The draft documents are currently being reviewed by the affected States and Indian tribes, the public, and other interested parties.

The Department will formally nominate at least five sites suitable for site characterization and will recommend three of the nominated sites to the President for site characterization as candidates for the first repository. I expect to make that recommendation late this summer or early in the fall. Site characterization will be carried out only at the sites approved by the President.

In a major program area, the need for and feasibility of a monitored retrievable storage [MRS] system is being considered as part of an integrated waste system that includes repositories, MRS, and the necessary transportation system. A proposal for the construction of an MRS facility is now being prepared for submittal to the Congress as required by the act.

Next, I'd like to talk about the Civilian Radioactive Waste Research and Development Program. The Nuclear Waste Policy Act also requires that the Department conduct certain activities in the generic areas of spent fuel storage research, development, and alternative disposal concepts as well as generic research, development, and demonstrations related to nuclear waste repositories. These activities are budgeted under the energy supply research and development appropriation rather than through funds collected from utilities and deposited in the Nuclear Waste Fund. The fiscal year 1986 budget request for civilian radioactive waste research and development is $23.4 million.

The Department's funding request for the Uranium Enrichment Program in fiscal year 1986 is approximately $1.6 billion in budget authority which is fully offset by $1.6 billion in projected revenues.

In January 1984, we announced our new business strategy and released the utility services contract to our customers. Response to the utility services contract has been very positive. Slightly more than 90 percent of the Department's previous sales base converted to the utility's service contract. This includes 45 domestic and 27 foreign electric utility customers. The results of that contract conversion strongly support our efforts to improve the financial position of the enrichment program.

We plan to continue these efforts. We must strive to capture remaining uncommitted demand by further reducing costs. We can continue to pass price saving on to our customers while fully recovering the costs. We continued enrichment operations at our three gaseous diffusion plants in 1984 and made significant progress in enhancing the overall economy of their operation.

During 1984, we had intensive technical and economic evaluation of the advanced gas centrifuge and the AVLIS technology, in addition, we have the Process Evaluation Board established by former

Secretary Hodel. Within the Department I have asked the question whether this Board is properly constituted and is the right Board to make the decision. I received answers in the affirmative. We fully expect this decision to be on track and we fully expect full technology to be given input to that Board as well as any congressional information that needs to be submitted.

The advanced centrifuge and AVLIS contractors have been generating extensive data. In May 1985, we will select the most promising technology for further development. This will include life cycle and reliability testing to confirm process performance and economics to determine the optimum development schedule. This further development is inherent in moving the technology selection date from 1987 to 1985 and we must insure technical adequacy before committing to deployment. We believe that there is a well-structured process in place for making that technical and business decision, and we ask for your continued support in seeing that this process comes to completion and we want to discuss the results of that selection process with you.

I'd like to discuss the state of the uranium mining and milling industry. In regard to the state of that industry I am aware of the significant contraction of the domestic industry from its peak years. In my confirmation hearings on January 31, 1985, I promised to provide within 60 days of taking office a specific report on my impressions to that point of the Department's possible action in regard to the uranium industry. We are in the process of completing that report within our projected schedule.

With regard to nuclear waste technology and remedial actions, our nuclear waste funding request for fiscal year 1986 is $11.7 million in budgetary authority as compared to $13 million appropriated in fiscal year 1985. The fiscal year 1986 budget request for the remedial action program is $233 million. This represents an increase of $73 million over fiscal year 1985 appropriations.

The role of the Department's nuclear waste technology program is to assist the States and regions in developing a reliable national system for managing commercial low-level wastes and to develop technologies that will safely and effectively treat and mobilize nuclear fuel cycle wastes, low-level, high-level, and transuranic. Our low-level waste program continues to provide technical assistance to the States and it has been getting useful proposed regional compacts presented to the Congress for consent.

In the waste treatment program, we conduct the research and development necessary to reliably solidify high-level and transuranic wastes for transportation storage and disposal. Our major fiscal year 1986 effort in waste treatment will be to complete the last phase of development in the process of incorporating high-level wastes into a borosilicate glass acceptable for disposal.

Our program for remedial action in certain contaminated facilities and sites is divided into five major activities.

The scope of these programs and planned fiscal year 1986 activities are as follows: No. 1, the formerly utilized sites remedial action program covers remedial action in 25 sites. In fiscal year 1986 remedial action will focus on continuation of ongoing efforts at the six highest priority sites.

No. 2, the second project covers our participation in a Federal and State cooperative effort to remove uranium mill tailings used for construction purposes in Grand Junction, CO, by the end of fiscal year 1986, we will have completed remedial actions at 576 of the estimated 604 structures requiring attention.

Uranium mill tailings remedial action project is directed toward the cleanup of 24 inactive uranium mill tailings disposal sites and several thousand associated properties. In fiscal year 1986 remedial action will be under way at 7 processing sites and over 400 vicinity properties will be cleaned up.

Four, the surplus utilities management program provides for the safe management and disposition of contaminated Department of Energy civilian program facilities. They are currently grouped into about 34 projects and they are no longer in use. The major project under this program is the decontamination and decommissioning of the Shippingport atomic power station.

Finally, the demonstration of high level waste solidification into borosilicate glass for acceptable disposal will continue at the western New York nuclear facility.

This concludes my opening remarks to you. We stand ready to answer any questions that we can for the committee. It is a pleasure to be here and I look forward to continued cooperation between the Department of Energy and this committee.

The CHAIRMAN. Thank you, Mr. Secretary, for comprehensive and well-presented views on the challenges you face.

Let me ask Mr. Rusche and then you, Mr. Secretary—some of the Governors are unhappy as we go about this process of trying to find the site for a high-level repository. We've slipped a little bit on our schedule and some of the Governors wanted another 30 days to comment on the environmental assessments [EAs] and some of the other decisions and some of the other factors. Since we're a little bit behind in the schedule anyway, why can't we get this extra time?

Mr. RUSCHE. Mr. Chairman, we've had the opportunity to try our best to work with the Governors and State officials. When I was first presented with the request from the Governors last summer, it was just after I arrived, and we then expected to issue the draft environmental assessments [EAs] somewhat earlier.

At that time, we had planned for a 60-day comment period. After confirmation and consulting with the Governors, we concluded that a 90-day comment period was appropriate, and that's what we allowed when we issued with the EAs in December.

We asked not only the States but other Federal agencies, the industry, and the general public to make response to the EAs, in order to balance the requirements of the act with respect to schedule and the interests which Congress expressed—and to which we are committeed—to work with the States.

I concluded that it was appropriate to hold to the March 20 comment period closure and have so indicated to the Governors that we will accept comments from the Governors whenever they can get the comments to us and we'll consider them to the best of our ability.

I think your question suggests that we might have extended that period for 30 days with relatively little damage to the schedule. In my judgment, if we extended the schedule we would invite the Federal agencies and the industry also to defer their comments for 30 days and, therefore, concluded on balance that it was better to get the comments we could on schedule and receive the State comments as early as we possibly could; and that was the proper balance.

The CHAIRMAN. How do we stand in meeting the major dates and deadlines? Is there going to be continuing slippage? There's nothing magical about the schedule we set up except that it was designed to focus everyone's attention on one thing and get going. I hope we can hang pretty close to that schedule.

Mr. RUSCHE. In my expression and I think former Secretary Hodel's expression, and I've discussed it with Secretary Herrington, our absolute commitment to the 1998 date to begin receiving fuel or waste is unequivocal. It's my judgment, in consultation with the Secretary and others, that, the early part of the process that we're in now, there are many, very difficult decisions being made and we were advised to take a reasonable amount of time—even if that amount seems to be in excess of that presented in the act itself—in order to make a good investment for the future.

I hope that, as we get to the point of characterization of the first three sites and the Congress has the chance to consider the MRS proposal, with these decisions behind us we can then begin to go ahead on a very much more predictable schedule. I think at this time it's a good investment to spend the extra time that we have and, in fact, we have spent considerable extra time.

The CHAIRMAN. You mentioned MRS. Let me turn to that for a moment. There's a great deal of fear and apprehension in some circles that MRS is going to replace the deep geologic storage. There are a lot of people who don't think we really need the deep geologic storage and that we can slip MRS into part of the system and that it would eventually be a substitute that'll be big enough where you won't have to have the repository.

What is the view of the Secretary and Mr. Rusche on this question?

Secretary HERRINGTON. That is not our view, Mr. Chairman. The MRS facility is being brought along in conjunction with the geologic repositories. It is our intention to stick to the schedule on the primary plan using that only as a part of the integrated system.

The CHAIRMAN. Let me ask one more question before my time runs out.

You mention on page 4 of the statement that most of the reduction from the appropriation is the result of imposing a moratorium on further development and filling of the strategic petroleum reserve. There are many people who argue that this is critically important for our energy independence and has a lot to do with the stabilization of prices and so on. Why, when prices are low—perhaps as low as they're going to be in this day and age—why do we not go ahead and put further amounts into the storage system?

Secretary HERRINGTON. Sir, I think the goal of all of this is the same and that is the energy security question. Back in 1977, when there was considerable debate on the level of SPR fill anywhere from 1 billion barrels on down, I think there was a rough guideline used that we need somewhere between 100 and 110 days import replacements from SPR and the figure of 750 million barrels was set at the time and was deemed appropriate based on oil import projections then. Today our imports of crude oil have substantially gone down, probably more than anyone would have estimated in 1977 and prior years. We will have a level in SPR at the end of fiscal year 1985 of 489 million barrels. It translates, under current consumption, to 108 days of imports.

The intent here is not to do any more than pause 1 year and look at SPR to see if that's an acceptable risk leaving it at the current level in light of the budgetary circumstances. There is considerable flexibility in SPR. It can go up to 610 million barrels at five current storage sites.

We want to continue with the enhancement of the pipeline. We want to continue with the acquisition of the right-of-ways for Big Hill. We want to keep our options open. We think a pause in the fill rate may be justified this year.

The CHAIRMAN. Mr. Seiberling.

Mr. SEIBERLING. Thank you, Mr. Chairman.

Mr. Secretary, as I mentioned I'm quite concerned about the decisionmaking process for the selection of the advanced techology for the uranium enrichment program. I understand that the Process Evaluation Board will be making recommendations in 2 or 3 months. In the prehearing questions, question 3B asked whether the selection will be based solely on the factors described in the DOE's criteria and methodology for the assessment for the AGC and Avlis technology. The answer was the Board will apply the factors described. It doesn't say that it will apply only the factors described. I wonder if you could tell me whether it will possibly apply other factors.

Secretary HERRINGTON. I'd like to make a general comment and I'll ask Assistant Secretary Vaughan if he has any additional comments.

The way I view this decision—I think it has to be made in early May because I know there are some markups that have to take place. I don't think we want to delay it. But overriding that we must get the right decision. So the first question I asked on taking this office is: "Do we have the right people making the decision?" We reviewed the Board. As to the procedures they've been following, given what I've been briefed on and what I've seen, we have some very competent people making this decision. I do not claim to be an expert on the process they are following.

I want to ask Assistant Secretary Vaughan if he wants to comment on some of the mechanics of that decisionmaking process. But as a bottom line, I would like the decision to be made and I'd like to have the full input so all of us are pulling together, and we're doing the right thing.

Mr. SEIBERLING. I certainly commend you for that objective. That's certainly what we want to see. But in other words, what you're telling me is that you're going to apply whatever factors seem to be necessary in order to come up with the right decision even if there are other factors than those mentioned in the criteria that the DOE has already published.

Secretary HERRINGTON. I don't mean to imply that, sir. What I mean to say is I want the process to work. I don't know exactly what that process is but I intend to personally monitor how this decision was made and who made it.

Hopefully, we have the right process and the right people. We will consult continually, not only with this committee but with other committees, on how this decision is being made. I don't want this to become a totally departmental decision without input from the appropriate people.

Mr. Vaughan. Mr. Seiberling, as you indicated we did, in mid-1984, publish the criteria and methodology for assessment of the advanced technologies. All the participants were provided with the documents. That document continues to provide the basic framework under which the Board is operating.

They have heard presentations from all of the technology advocates and manufacturers. They've heard from operators of uranium enrichment plants today, from utilities, from a wide segment of the population trying to match all views. The document remains the basic criterion. They're obviously in the period of deliberation over a number of months. Other things will come up which they will have to appropriately consider in presenting their findings to the Secretary.

Mr. Seiberling. All right. Now, the Board members are all from inside DOE, assuming that the Chairman is basically tied with DOE, although BPA is actually an independent agency. Does the Bonneville Power Adminstration come under DOE?

Mr. Vaughan. Yes, sir; Mr. Johnson is a DOE employee.

Mr. Seiberling. So they're all from inside DOE.

I'd just like to have the technical background of each one of those members. Let's start with Mr. Johnson, the Chairman. What's his area of expertise?

Mr. Vaughan. If I may before I comment specifically on each of the members, former Secretary Hodel indicated in his charter to the Board that he wanted a very balanced view of not only the technical merits of the two competing technologies but also of the potential business and economic aspects of deploying those and utilizing them over a period of time because each is equally important. So the Board, which was chosen by former Secretary Hodel specifically to be DOE persons and not to constitute what would have to be an advisory committee, has a mixture of people with those types of talents. Mr. Johnson's particular talents with his technical background, are largely in the management and economics of a major power administration. Former Secretary Hodel thought he brought good balance as Chairman of the Board.

The Vice-Chairman of the Board, Mr. Jim Leiss, is a recognized expert in the area of high energy physics and a very competent scientific and technical individual.

The Executive Secretary of the Board——

Mr. Seiberling. Mr. Leiss—is Mr. Leiss' experience primarily in the laser end rather than the centrifuge?

Mr. Vaughan. No, sir; it is not. He is a general person capable of evaluating the physics and engineering of both processes and I am convinced from personally talking to him prior to his selection to the Board, that he came to the Board with absolutely no bias as to either technology.

The Executive Secretary of the Board, Kermit Laughon, has 20 years of experience in reactor development programs and management of both technical and fuel cycle work.

Mr. SEIBERLING. Has he any background in either the AVLIS or centrifuge processes?

Mr. VAUGHAN. He was specifically selected as Executive Secretary without having precise prior experience so he could provide an independent judgment. Mr. Dean Mitchell is the Department's most competent individual in the area of facility construction with a number of years experience in that regard; he is also a retired Navy admiral.

Mr. SEIBERLING. Has he any background in either AVLIS or centrifuge technology?

Mr. VAUGHAN. He has background in the operation of the plants in which these types of technology would operate and be deployed.

Dr. Norton Haberman is the Department's most competent individual in terms of the development of both the advanced gas centrifuge and the AVLIS technology.

Mr. SEIBERLING. Has he any experience? My information is his experience is primarily in laser technology.

Mr. VAUGHAN. I think he has experience in both technologies.

The last two people on the Board are Sherry Pesk from our headquarters office, and Joseph Parks from the Oak Ridge office. Their principal capability is in the business and economic aspects of the deployment.

Mr. SEIBERLING. Thank you. My time has expired.

The CHAIRMAN. Mr. Craig.

Mr. CRAIG. Thank you very much, Mr. Chairman.

Secretary Herrington, on page 4 of your statement, you mention a 5-percent pay reduction for Federal employees. If that 5-percent reduction is not enacted into law, how will you make up the reduction in your overall budget?

Secretary HERRINGTON. That particular proposal amounted to $26 million, and if we cannot make up that through reprogramming, we'll have to ask for a supplemental.

Mr. CRAIG. The chairman took some time, and I'm as concerned as he about the siting activities that you're involved in now in the five States under consideration. Mr. Rusche spoke of the time factor. It appears that we are in a time curve now that sets us 5 months in arrears. What have been the difficulties that have brought us to that point? Was it bad scheduling in the first instance, or have you had some difficulties that were unforeseen by all the parties at the time of the scheduling?

Mr. RUSCHE. I think the dates that are in the act, as the chairman noted, were based on the then best estimates at the time the act was adopted. I think these very close-in dates have to be taken with some element of imprecision. Nevertheless, we had adopted those as statutory requirements and we've looked at them. The same act requires us to be faithful in interacting with the States and with other Federal agencies, and so forth. I think the simple answer is that it's been a matter of judgment, my judgment, most recently, as to how to allocate that time, whether it was better to take additional time to get better decisions at the front end of the process for so many crucial decisions being made. It was clearly a matter of judgment on my part.

Mr. Craig. I'm not so critical of the timeframe, as much as I am of the allowance of input from the Governors and the States involved as has been mentioned. It is a sensitive issue and will continue to be one down the road, and obviously, very critical in the overall final decision.

On page 12, you mentioned subseabed disposal of radioactive waste. How much are you spending on that alternative disposal concept at this time?

Secretary Herrington. For fiscal year 1986, about $12.5 million.

Mr. Craig. Is it an alternative?

Secretary Herrington. This is all R&D money. I think it's an option that should not be foreclosed. I don't think that we are prepared to say that progress should be started on construction, but I think the line of R&D should be kept open as a backup.

Mr. Craig. Once again, Mr. Secretary, on page 13, you mention that you will be submitting a license reform proposal to Congress. How will that proposal differ, or can you tell us at this time how it might differ from any other proposal the Department has submitted in the past and when will it be submitted?

Secretary Herrington. I think the exact differences between the proposal that is already in from the NRC and some of the other proposals—I'm not prepared to lay it out this morning—but they're still under review. I think the decision should be fairly soon, because we're going to need to come to a resolution, I would guess, within 60 days would be my timeframe.

Mr. Craig. And we can anticipate something in that approximation?

Secretary Herrington. Yes, sir.

Mr. Craig. Mr. Chairman, I have no further questions. Thank you very much, Mr. Secretary.

The Chairman. Mrs. Vucanovich.

Mrs. Vucanovich. Thank you, Mr. Chairman.

Secretary Herrington, as you well know, high-level waste repositories are a very much talked about issue in my State. Most of the outcry is against the site itself, but there are people, like myself, who have decided to reserve judgment until the studies and the data are complete. Strangely enough, the people who live the closest to the site are the ones who have taken a wait and see approach and are not as upset as some of the people who live farther away. The Governor, on the other hand, has been very outspoken against the site, along with State legislators from other parts of the State. There are people who are closest to the site who are concerned that since the Governor has taken such a strong position against the site, that he cannot fairly represent their concerns in the siting process.

I think we know that the Nuclear Waste Policy Act mandates consultation only with the State and affected Indian tribes. I think my question is, is it possible under the act for DOE to work with local entities as well?

Mr. Rusche. Mrs. Vucanovich, if I might comment. You mentioned, rightly so, that the act focuses our attention on interaction with the States and the Governor and affected Indian tribes. The principal mechanism that expresses itself through is through State grants for funding and support for activities of the State and its various groups. One way that such local folks could participate through the funding mechanism is to receive grants from the Governor. As you describe the circumstances, that might not seem especially likely, but perhaps—we will do our best to try to provide opportunities to facilitate that.

There is another mechanism that does not provide funding, of course. And that is, the environmental assessments, and virtually everything that we're doing will be done in a way that will offer the opportunity for public comments. So any citizen will have the opportunity on equal footing with anybody to provide us written comments or oral comments, as is the case now, in the hearings and briefings that have been going on on the environmental assessments. That may not be the optimum solution, and I suspect that as we go through this process, we're going to want to work with you and the Governors to find an equitable way to see that all the parties that have legitimate interests have an opportunity to participate.

Mrs. VUCANOVICH. Thank you. The hearings—and the hearings are still going on, as we know, and we are getting active participation. Are you getting participation from both sides of the issue, or are you getting participation from just one side of the issue?

Mr. RUSCHE. The reports I have from the hearings, which suggest somewhat as you suggest, that at the sites closer to the potential repository site, we're getting a broad participation from local people. As you move to the State capitals, we tend to get participation from the State, the Governor and people who are not quite so closely associated with the local factors. And I think on balance, we have heard from a number of parties.

Mrs. VUCANOVICH. I have a couple of questions about grant assistance to the States under the Nuclear Waste Policy Act, and I realize that since Nevada and DOE are involved in some litigation, that you may not be able to answer this, but DOE has determined that Nevada cannot do independent data collection with grant money at this stage of the site selection process.

Has the Department made a policy decision about whether independent data collection will be an eligible activity for grant assistance during some later stages of the studies?

Mr. RUSCHE. I regret to have to say it, but I think the attorneys will tell me that, since the matter is still being briefed and has not been argued, our statements that you referred to, accurately, have been the basis for the discussion, I think it would be better if I did not get into a discussion of what might be the case in the future, in that the courts might offer some guidance that we'd be obligated to follow. I apologize for not being able to be more forthcoming, but I think that's the right advice.

Mrs. VUCANOVICH. I understand that. It's just that it is an important issue to the State, and most particularly, as you know, because there is a lot of outspoken opposition through our State legislature.

Mr. RUSCHE. I think the most general comment is, we're going to do our best to cooperate and work together. Just what form that takes, we'll have to see.

Mrs. Vucanovich. I would just like to thank you very much, because I think you have made a great effort to get along with the people in my State, and it's a very hot issue, as you well know, and I appreciate your input, and also, Secretary Herrington's. Thank you very much.

No further questions, Mr. Chairman.

The Chairman. Mr. Markey.

Mr. Markey. Thank you, Mr. Chairman,

A little over 2 years ago, Congress put into place a process that, if properly followed, will eventually lead to the safe emplacement in containment of our nuclear waste. Since then, the Department of Energy has made significant progress in implementing the Nuclear Waste Policy Act, and a number of major decisions are to be made in the next several years. At this point, I have not made any judgments or reached any conclusions about the Department's program implementing the Nuclear Waste Policy Act; however, I do believe that the diligent oversight of Congress will be crucial in assuring that the Federal Waste Management Program is not only technically sound and cost effective, but above all is regarded as fair and one in which the public can place its trust.

So along those lines, Mr. Secretary, I'd like to just ask a few questions to perhaps just clarify where we are in the program.

In July 1983, the DOE estimated that the total Waste Management Program costs might range from $15.3 to $20.3 billion. In 1984, DOE estimated a cost up to $25 billion. Could you tell me, what is the Department's current estimate of the total program cost?

Mr. Rusche. Mr. Markey, if I may, the Department is obligated each year to publish a total life cycle cost estimate. We just finished that last estimate and submitted it to the Congress. I think the number is about $25 billion or thereabouts. I would prefer not to give you the precise number, on the grounds that those numbers are documented and correct, to the best of our ability, but you're correct in that we are both very attentive to and are obligated to bring to the attention of Congress the adequacy of the fee which we're collecting to fund the program, and thus the cost of the program.

Mr. Markey. How do you account for these large increases in such a short period of time?

Mr. Rusche. I think the early cost estimates were based on relatively early and imprecise knowledge, and as we get into the matter, we understand more what is involved from the facilities standpoint, as well as from an interaction standpoint. And time, in this process, is a large factor, and money.

Mr. Markey. Mr. Secretary, do you believe that the Department will place the first repository in operation in 1998?

Secretary Herrington. That's our goal. That's what we're going to try to do, and we will be in a position to meet that in 1998. I think there's a lot of incentive, both on the side of utilities and on the side of the Government, to meet that goal and to stay within the cost limits and the fees charged.

Mr. Markey. So yes is the answer; you will be able to meet it?

Secretary Herrington. Yes.

Mr. MARKEY. In uranium enrichment, as you know, under section 161(v) of the Atomic Energy Act, the Department of Energy's uranium enrichment program is supposed to be essentially self-supporting. That is, the Government's costs are to be fully recovered over a reasonable period of time through charges for uranium enrichment services; however, in fiscal year 1984, the program ran a deficit of over $380 million, and in fiscal year 1985, it went over nearly $103 million in the red.

Given this performance, how can the Department predict that this year's revenues will exactly equal costs, as you have done in your fiscal year 1986 request to the Congress?

Mr. VAUGHAN. Mr. Markey, and I may need some help from my accountants behind me, the money that gets appropriated at the beginning of the year goes into the overall Department funding, but, in fact, we operate the enterprise within the revenues that we took in within those years.

In fiscal year 1985, we will be about $102 million short in revenues versus appropriations.

Mr. MARKEY. And the year before we were $380 million short, but this year you predicted that you're going to take in the same amount of revenue as you spend. I just want to know what is different between this year and last year and the year before. How come all of a sudden, we're going to pick up all these new revenues? Where are they coming from? Or what are you cutting out? Something's got to be different.

Mr. VAUGHAN. I think the basic difference this year is we, in fact, have the enterprise operating on a much more businesslike basis. We have made an aggressive effort in the past year to firm up and stabilize our share of the uranium enrichment market. We've made some real economies in the operation of the gaseous diffusion plants, operating them at about 10 percent less at the end of the year than we did in the prior years. So I think we've got just a better overall handle on the operation of the enterprise, and we should be able to come out with better numbers.

Mr. MARKEY. So you're telling us that's going to save $103 million, what you've done? Better management is going to bring $103 million?

Mr. VAUGHAN. I think we very well could save that much.

Mr. MARKEY. That next year you're not going to come back to us—I mean, you, right now, are sure that that's the fact of the matter, that $103 million actually is coming in this year? Because we want to just deal here with a realistic budget projection, that's all.

Mr. VAUGHAN. I think with certainty this year, we can operate the enterprise where the revenues balance the appropriations. We have more certainty in doing that than we had in the prior years.

Mr. MARKEY. I just have one final question. That's on monitored retrieval storage. The Congressional Budget Office has estimated that delays in repository startup are compensated for by monitored retrieval storage capacity, would have the following cost impacts on the program.

If there was a 3-year delay and you had to build a 15,000-ton monitored retrieval storage, it would cost $709 million. If there's a 10-year delay and you had to build a 30,000-ton MRS, $2.75 billion, a 10-year delay; and additional waste would result in a 72,000-ton MRS, which would cost $5.79 billion.

Do you agree with those estimates?

Mr. **Rusche**. Mr. Markey, I think those estimates were made by the GAO under a very specific set of assumptions. I'm not sure that I would disagree with those estimates and the assumptions, but I won't agree with the assumptions.

Mr. **Markey**. The Congressional Budget Office did it, not GAO. You don't agree with the assumptions? What do you disagree with?

Mr. **Rusche**. I think the assumptions that will prevail are the ones that we will be presenting to Congress in our proposal that will come up later this year, in which the Congress will have an opportunity to speak on with respect to timing and integration. One assumption I disagree with is that MRS will be taken as a substitute for the repository, put into operation later in the cycle, much later than we would intend to do. In fact, we expect to realize cost savings as a result of introduction of the modified retrievable storage facility.

Mr. **Markey**. So what would you say is now the base case assumption for repository startup and delay, or startup delay?

Mr. **Rusche**. Startup delay? Our projection is that we are going to start the repository in January 1998 as required by the act.

Mr. **Markey**. What does that mean with regard to MRS?

Mr. **Rusche**. We are in the process of doing the studies that are required by the act. That will be included in the proposal to Congress. And, as I now view it, and this is obviously very preliminary, the modified retrievable storage facility will come into operation on or about that same time schedule, maybe a little bit ahead of it. The net effect, we hope we'll be able to show you, will be a net cost savings to the system, or at least no increase.

Mr. **Markey**. What kind of costs are you talking about?

Mr. **Rusche**. For the facility, I suspect that the design, which is not now complete—and I hesitate to give you numbers, but my current estimate is that the cost will be about $1 billion.

Mr. **Markey**. How much?

Mr. **Rusche**. About $1 billion.

Mr. **Markey**. And what will be the capacity?

Mr. **Rusche**. The capacity is not a very strong cost factor, it's just extra space for storage. The central cost of the facility rests in its land and its storage space. So whether the capacity is 10,000 or 50,000 is not a very strong cost factor.

Mr. **Markey**. Thank you, Mr. Chairman.

The **Chairman**. Let me just go back to the fears I referred to earlier. If you're going to have MRS completed at about the same time as Geologic Storage, why do we need them both?

Mr. **Rusche**. Mr. Chairman, my view from the very beginning upon entrance to this program is that a repository is an absolutely essential component of the system, but it is not a whole system. We are, right now, in the process of beginning characterization, we hope, or shortly will begin characterization. We have concurrent design work going on for each of the three potential sites, whichever three are picked, and I think that we will find that when we add an MRS to the system, the transportation problem will be very much improved. We now anticipate we will have about 120 reactors operating at the time the repository goes into service.

We will much improve the transportation safety and cost effectiveness. How much, I can't tell you, that's the part of the study that's underway. But I believe and hope that the study will be presented to Congress later in the year and will give you a basis for making that same judgment.

The CHAIRMAN. I made it clear, and I want to make it clear again, that I think what the Congress did in 1982, I was closely associated with the bill, we, as a nation, made a decision for deep geologic storage. That's what we're going to do as the final, bottom line decision.

And they tried to sidetrack us. We had vote after vote on amendments. MRS was viewed, and still viewed by some, as a substitute for deep geologic storage. To this member, that is not what we decided to do.

Mr. RUSCHE. Mr. Chairman, I think the Secretary's comment a moment ago, and my comment, both publicly and privately, is that MRS is not a substitute for, it is an essential element in making the system function cost effectively and safely.

The CHAIRMAN. All right. Mr. McCain.

Mr. McCAIN. Thank you, Mr. Chairman. Mr. Secretary, welcome to your new position. It's the first opportunity I've had to welcome you. I wish you every good wish despite the fact that you weren't able to appoint the hundreds of names I sent over to you. [Laughter.]

Secretary HERRINGTON. Thank you, sir. The fact that I could survive that job with one friend left in the world was very encouraging.

Mr. McCAIN. Other than that, I'm sure it is a very rewarding position. I would also like to thank you for the proposed funding for the copper cannister development. As you know, the Swedes, and other European countries, have proven that copper cannisters are a viable method for nuclear waste storage. I would look forward to working with you in whatever way possible that we can to continue in that effort.

On page 14, Mr. Secretary, of your statement, you said two key elements in assuring the health of the nuclear energy option are the ability to maintain competitive domestic uranium enrichment capacity, and a demonstrated ability and willingness to handle radioactive waste in a technically sound and safe manner.

I certainly agree with that. I would also say to you that there is a third key element to maintaining the nuclear option which may even supercede these. That is the viability of the industry itself. I believe that the most oft used quote about the nuclear industry today is that no one in their right mind would apply for a license for a nuclear power plant today.

I think that's a nearly unanimous opinion throughout the industry. About 1 week ago, we had the NRC before us and, although I'm beginning to sound a little bit maniacal on the subject, I really believe that if we are going to preserve the nuclear option in this Nation, it is critical that we try again to move forward with a bill for simplification of licensing and design procedures.

As you know, in past years, there has been this effort made which has gone nowhere for a number of reasons. One of them is the inability of the Secretary of Energy and the NRC to agree on a bill. In as forceful terms as I know how, I have requested the NRC to work with you and interested Members of Congress, the industry, and environmental groups, to try and come up with a bill we can all agree on and get passed.

Recently, there was a Forbes magazine article on nuclear power, which I commend to your reading if you haven't seen it. One of many dramatic statements in there was the fact that a French nuclear reactor which was just built costs 4 cents per kilowatt hour. The one in New York that has just been completed costs 18 cents per kilowatt hour.

I believe that there are delays in licensing procedures that are brought about by people who are opponents of the industry. But I also believe the basic reasons for all of these problems is because we simply seem to reinvent the wheel every time we build a new nuclear powerplant. I'm not clear, although Mr. Asselstine and others on the NRC voiced their previous objections, I'm not clear as to all of the differences that exist between DOE, NRC, the Congress, environmental groups, and the industry.

But I believe, if we are going to preserve this option for the future, if not immediately, certainly the long-term prospect for the nuclear option, it is of critical importance that we try to get together and come up with a meaningful piece of legislation that will have a chance of passage in the Congress.

That's a long diatribe but I'd appreciate your response.

Secretary HERRINGTON. I think you have made some very valuable points. I think whether we can or cannot agree with the NRC proposal is an academic question. They are an independent regulatory agency and, obviously, have their own biases. I think their bill, as I've seen it, provides an outstanding base to work from.

On a basis from our Department, I would like to see a few more items addressed. I think there's a lot of work being done in this area; all of the bills have good points to make and they all need to be considered.

I don't anticipate that we will be submitting a bill that is identical to the NRC proposal. I think we may go a little bit further. I think it's something we will want to address in the next 60 days.

Mr. MCCAIN. Well, if I can say this, I think that compromise is called for in any piece of legislation and I asked the NRC to consider compromises from some of their positions; and I would ask you to do the same thing.

The viability of a piece of legislation will be greatly enhanced if we can substantially agree on a piece of legislation rather than having two separate bills, or many separate bills.

I'd just like to mention one other aspect that concerns me on the issue of the proposed disposal sites, which has been pretty well massaged here this morning.

From your statement in response to one of the questions, only one State is presently being negotiated with, the State of Washington. What's the status for the other States where these proposed sites are being denominated?

Mr. Rusche. Mr. McCain, the act requires us to begin negotiations with all the States to develop consultation and cooperation agreements. The State of Washington is a State with which we have made the greatest progress. We are open to, and interested in, negotiating such agreements with other States.

I think the fact of the matter is we have not evolved in those negotiations to anything like the status we have with Washington. We are committed, and I think the States are committed, but there are so many questions that are being dealt with as sort of first time societal questions; particularly, I think we are dealing with very unique Federal-State relationships that we have not heretofore charted.

And, although I would be much happier if we had consultation and cooperation agreements in place, I think there are a number of wrinkles that we've got to work out so that the States can be comfortable that we are dealing honestly and openly, and that they are dealing responsibly and openly. I think that will come.

The very simple reason is that we have not progressed far enough to have one in shape. There's no lack of commitment on my part, nor do I believe on the States' part.

Mr. McCain. Finally, I would like to caution you in dealing with the Indian tribes. Indian reservations across this country have served as a disposal ground for toxic wastes, chemicals, and other undesirable elements which were not wanted on non-Indian land. I would suggest that you not give the impression to the Indian tribes that they are going to be another repository for unwanted materials from non-Indian land.

Mr. Rusche. If I may comment, sir, I believe we have had no such conversation as to such land considerations. I would comment, though, that the act provides for specific considerations to affected Indian tribes, and we now have grant arrangements with three tribes—Nez Perce, the Umatillas, and the Yakimas. Their principal involvement is through the transportation considerations, as transportation corridors might pass through Indian lands.

[Editor's note.—The Department subsequently supplied the following information:]

> In fact, we have a grant with the National Congress of American Indians to serve in an ombudsman role on issues of concern between the Department and both first and second repository Indian tribes.

Mr. Rusche. I would hope, if the weather smiles, to visit one of the Indian reservations in the Northwest later this week. These are important considerations, I think, in making the whole system work. We are committed to making it work.

Mr. McCain. Thank you. Thank you, Mr. Chairman.

The Chairman. Mr. Strang.

Mr. Strang. Mr. Secretary, I also would congratulate you on your new office. I hope everything goes well for you. I ask you, are you committed to the idea that the Department of Energy should stay a separate Department within the Government?

Secretary Herrington. I think I've raised this several times at my confirmation hearings, but not before this committee. I would be pleased to go into that point if there is interest here.

My position, that I have stated in testimony and have also given to a number of Senators, and publicly as well, the guidance I had from the President of the United States when he asked me to accept this position was to review the plans, policies, programs, and personnel of the Department and recommend to him within a reasonable period of time any options he might have for organizational management.

There has been, I think, an over-reaction in the press on the merger of the Department of Energy with the Department of the Interior. There was, under the Federal Energy Reorganization Act, an attempt to merge Energy with Commerce. I think the first Secretary of Energy in this administration said that he was going to dismantle it.

I'm not unmindful of that background. I only have one thing in mind and that is advising the President to the best of my ability of options for certain governmental functions.

I might say a couple of things that impressed me. No. 1, there are some very fine Government activities existing in this Department that should not be jeopardized.

No. 2, I am not unmindful of the effect on morale on Government employees when you fool around with an organization for a long period of time. I hope to get right at this and make my recommendations, and move ahead with whatever the decisions are.

I, of course, will carry out any desires of the President of the United States in this regard.

Mr. STRANG. Talking about the Davis Canyon site, which is of some concern to my part of the world, how would you propose to get material to that site from the East?

Mr. RUSCHE. Mr. Strang, we have not made detailed routing considerations. We dealt with routing in a fairly generic way to determine if these sites were worthy of investing $500,000 to $1 million for characterization.

I think we have a chance, should Davis Canyon appear to be considered—and, right now, it does not appear to be a site that would be characterized, but were it characterized and were it considered, we would deal with the subject in an extensive way in the environmental impact statement, which is required to be part of the decision documentation that the Secretary, the President, and the Congress would have to look at in 1990.

We have not selected a particular path or a particular route. We have done thousands of studies which show generic possibilities.

Mr. STRANG. I'm aware that the cannisters are really pretty safe if you drop them from 30 feet down on spikes, and so forth, but the people don't believe that. And I would wonder. You'd have to come out I-70. You couldn't go through the Eisenhower Tunnel. They wouldn't let you, would they?

Mr. RUSCHE. I don't know how to answer that question at the moment. I think some of the packages would be acceptable, but I think today's rules would not permit it.

Mr. STRANG. My concern is, first, somebody came up with a concept of going to that site without realizing what is involved. You're talking about an 18-wheeler having to leave I-70 and have to go up over Loveland Pass at 12,000 feet. And it's a very narrow, twisting road, very dangerous roads, and the possibility of an accident is manifest. So it's a concern that we wanted to bring to the Department as part of their considerations, because you simply can't get there on I-70 if you're not allowed to go through the Eisenhower Tunnel.

Mr. RUSCHE. We will have to deal with that in any consideration made. As the chairman mentioned early on, as he noted in our budget request, there is a sizable increase in our proposed spending and work in dealing with the transportation issue, I appreciated his noting it and in allowing me to comment to you.

One of the first things that became very evident to me was that the States in which repositories are likely to be located, whichever ones they might be, have local considerations that are very intense. But the most questions I've gotten have been from the corridor States and, there, almost every State in the Nation is likely to be involved. That leads strongly to the conclusion that we need to optimize the transportation system, and too, the idea of an integrated system with an MRS in it.

Mr. STRANG. Thank you. A couple of questions.

My colleague from Arizona's comments about the uranium industry are very telling. I'm very concerned about your report which talks about a continuing disaster in that economy through 1986 or 1987, because it isn't easy to just turn an industry back on like a faucet. And the uranium industry in our part of the world is absolutely sick. I believe they're going to go out of business.

I have no particular suggestions except I hope you're aware of the fact that we might need to do some stimulus over and above your proposal here over the next couple of years. I don't know quite what that would be, but it is extremely serious and I think strategically questionable.

Do you have any comment on that?

Secretary HERRINGTON. I have met with some representatives of the uranium industry, and I plan in the month of April to meet with, I think, six presidents of the uranium industry. They met with former Secretary Hodel before me.

I understand their problems. The plain fact is that there is not the demand that was anticipated during the 1970's. It's a very serious problem. We find it in other industries today, and we are also under attack—I don't know if I should use the word "attack," but by foreign enrichment activities, as we are in other industries such as steel and textiles. Our domestic industry has to get competitive with the foreign sources.

This is one of the reasons we are are working so hard to manage our enrichment programs, better and better, so we are not unaware of the problems. It requires constant monitoring. And you're very correct, it's a very serious situation.

Mr. STRANG. Thank you, Mr. Secretary.

Mr. Chairman, I have no further questions.

The CHAIRMAN. Mr. Barton.

Mr. BARTON. Thank you, Mr. Chairman. I'd like to also welcome the Secretary of Energy. I'm new to my job like you are new to yours. I hope we can learn together. I might point out that I was a White House fellow at the Department of Energy 2 years ago. So several of your colleagues and coworkers in the Department are friends of mine. I know they'll help me all they can.

I'd like to thank the chairman for his work in 1982 in passing the nuclear waste management bill. I think it's a good bill and something that we can work with. I'd like to comment on one of my colleague's questions on the dollar numbers and whether they would be met this year.

I think our program would be unique if we actually met the targeted numbers. If everything that you state turns out to be actually true. we all realize the things that can happen.

Did you, in your comments about making a definite site selection preference to the President, state why it might be late August or September before you did so?

Secretary HERRINGTON. We would target that date, sir. We hope in late summer, early fall, to make recommendations of sites to characterize to the President. The President will approve the three sites to characterize.

Mr. BARTON. So you're basically just finalizing the recommendation? You don't see any major problems cropping up that would prevent you from meeting it?

Secretary HERRINGTON. I think it's too early to tell. We still have considerable input from the State and we have, in a number of cases, agreed to take further input beyond the March 20 date to accommodate certain factions.

I will tell you, if a major problem crops up, we want to be flexible. We want to take that into consideration. As of today, I can say that we are targeting that date.

Mr. BARTON. Do you consider the lawsuit by the State of Texas against you a major problem?

Secretary HERRINGTON. I regret to take the same position that Mr. Rusche has taken. I think it's not appropriate for me to comment on a lawsuit or what effect that may have. I realize the effect of a lawsuit may be different from the issues involved in the lawsuit, but I would rather stay away from that subject so we do not prejudice the case.

Mr. BARTON. I don't mean to prejudice the case. In general, when Ben Rusche says something, you can put a lot of stock in it.

Secretary HERRINGTON. I would agree with that.

Mr. BARTON. To get off the subject, I want to come back to nuclear waste management, but one of the recommendations of the Grace Commission report which I worked on very briefly in the Department of Energy, was to privatize the power marketing agencies.

What's your opinion on that?

Secretary HERRINGTON. We are anxious to take a first step in that direction. That would be to see if we can't come to an arrangement with the State of Alaska that would allow them to take over the Alaskan Power Administration. I think that's a legitimate beginning. See how it works.

I would in general terms agree with that recommendation insofar as we try it in Alaska. If you then take a step and want to go forward with private power marketing, such as the Western States, or the Bonneville Power Administration, that's a different case. We ought to look at it more carefully.

But, in general concept——

Mr. **Barton**. In the Tennessee Valley Authority, do you think that private power companies, or private utilities, have the funds available? If we wanted to sell them, would there be a buyer?

Secretary **Herrington**. This is a problem you're going to have to look into. If you're going to sell it, privatize it, you're going to have to raise rates to make it an attractive investment. When you raise rates, you get into situations like the aluminum industry and Bonneville and other special interests in jurisdictions. And it becomes more political, and you also get into public industrial policy that you are setting by this.

So I think it's a far from simple issue.

Mr. **Barton**. Your nuclear waste fund this year has a little over $500 million in it. Is that correct?

Secretary **Herrington**. Yes, sir. I think the figure was $527 million, very close. Disposal fees collected, under the Nuclear Waste Policy Act of 1982, through February 1, 1985 are approximately $553 million.

Mr. **Barton**. Will you begin in fiscal 1986 to use the money that's been collected to pay for part of your activities in nuclear waste management—is that the way it works?

Secretary **Herrington**. We plan to run exactly collections and expenditures with very little lag between the two, and power companies are monitoring this as well as us. We think we have the right charge per unit and we think we have it dovetailed with expenditures. And we're running a legitimate business enterprise.

If that changes, of course, we would review it at the time. We don't anticipate going off track.

Mr. **Barton**. Now, as far as the one-time fee that the private utilities can pay, you mentioned in your prepared testimony that there are three options as to how they can pay it. But you don't enumerate those.

What are those three options?

Mr. **Rusche**. Mr. Barton, the three options are:

Utilities can pay the entire one-time fee without interest if they pay by June 30 of this year.

They can wait until the waste is accepted in 1998, or whenever their time comes, and pay the full amount with interest accumulated up to that time. Or, third, they can pay in 40 quarterly payments beginning in 1988.

We have made an attempt to estimate what the likely outcome is. We really won't know until June. The current estimate is that of the $2.3 billion, that is, the one-time fee owed, so to speak, based on our current estimates, payments which may be made in June approximate somewhere between $700 million and $1 billion. This is what would likely be paid toward June.

Mr. **Barton**. But do you expect that there's going to be a pretty wide dispersion of these options? That some people are going to pay the one-time fee right now up front, and some are going to wait?

Mr. **Rusche**. Yes. The best estimate we have now is that about $700 million to $1 billion will be paid as the full payment, as the one-time obligation for several companies, and that that will be paid in June.

The other two are not very clear. I think companies are looking at what is the best business choice for them, and we'll only be able to tell when they make that choice. They really don't have to make the choice until 1988. And if they miss that date, then they defer it until the final time.

Mr. BARTON. And those that do pay this June, so to speak, does that money go into a trust fund and accrue interest?

Mr. RUSCHE. It goes into the Nuclear Waste Fund and is useful for appropriations, just as we're talking about appropriations today. It can accumulate interest and we have the opportunity to invest it, just as a business.

Mr. BARTON. Another general question. Can the Governor of a State veto the site selection that you nominate? There was some talk about that 2 or 3 years ago, and I don't remember the final resolution of that issue.

Mr. RUSCHE. The chairman will well recall that discussion proceeded at length at the time of the bill, and others of you who were there, the act provides that the characterization discussion is not subject to the State's veto or disapproval. The environmental assessments are subject to judicial review for competence and quality. The first opportunity for the State to disapprove would be the President's approval of the site for the repository in the 1990-91 timeframe.

Mr. BARTON. Does that mean the Governor can veto, or cannot?

Mr. RUSCHE. He cannot veto the site selection for characterization, but then the Secretary referred to this for the summer or fall the Governor of the selected host State can express disapproval and veto, as it were, absent the two House resolutions to override in the 1990 timeframe for selection of the repository.

Mr. BARTON. With that in mind, is it true that the only site under review right now that the people of the State appear to actually want is the one up in Washington?

Mr. RUSCHE. I certainly would not characterize it that way. I don't think the people of Washington have really spoken, nor have the people of Texas or Nevada, or for that matter, any of the other States that are involved, in which sites are included.

I think the question that's before the States is whether or not we've made an appropriate choice for investing the money to characterize the sites. We don't have a basis today for selecting the site either. I think the important point is to have the opportunity to use the best data we have today and find from among those potential sites, three sites to characterize which we've identified, barring some new information, and which from among those after characterization is the best site.

Mr. BARTON. I appreciate you, Mr. Secretary, coming up and I look forward to working with you along with the other members of this committee.

The CHAIRMAN. The gentleman from New Mexico.

Mr. LUJAN. Thank you, Mr. Chairman. I just have a couple of quickies. One, I suppose, was spoken to by, Mr. Secretary, my favorite soapbox issue. It has nothing to do with waste management. I just want to raise the level of concern and keep it up there before we go into the middle nineties or late nineties, when all of our powerplants are built, and the need for research into what I consider where we need smaller machines both in the fission and fusion business. That's just a level of concern that I want to raise and keep it before the Department at all times.

There is one question also of concern. DOE used to accept transuranic waste on a full-cost recovery basis. DOE has decided not to continue to do that.

What are we going to do with it then? There are a number of installations that need to be decommissined. And, as a matter of fact, I was concerned whether the first action—as a matter of fact, it was on January 3, I wrote to then-Secretary Hodel about that problem.

Did the Department consider accepting transuranic wastes? If not, what are we going to do about the problem?

Mr. Vaughan. Mr. Lujan, if I may, let me respond to that question. First of all, going back to your prior personal concern, as you may be aware, in other parts of our budget, we have structured our civilian reactor R&D program to give more consideration to the smaller modular machines than we have in the past. We appreciate your continuing interest in that regard.

I think our current budget makes a good start at that.

Mr. Lujan. Also in the fusion business.

Mr. Vaughan. As you know, I don't own the fusion business but that's also well-noted. On the subject of transuranic wastes, as we are prepared to reply to you—as you know, we do not currently have any specific authority to take such wastes unless they were specifically for research purposes. We are well aware of the problem of these wastes, which some people call "orphan wastes," and have engaged in some dialog with the Nuclear Regulatory Commission, which has the authority over the definitions of the licensing and disposal, as to ways to address the problem.

A good set of definitions needs to be made. As you know, there is some ambiguity in the gap between the definition of "low level" and "high level" waste. Once that happens, I think we do need to put in place, just as we have for high level waste and low level waste, some specific machinery, if you will, for exactly how these transuranic wastes can be handled from civilian facilities.

We will continue our dialog with the individual companies, who do have these wastes and need to dispose of them as they seek to decommission the facilities, to try to facilitate some reasonable arrangement for both parties pending getting that machinery in place.

Mr. Lujan. You know, during the consideration of the Nuclear Waste Policy Act, as a matter of fact, I had an amendment that dealt with that problem. And, at that time, it was my understanding that we not pursue that amendment because DOE would resolve the problem. And as a matter of fact, you would consider all of these under your research and development authority that you had as you were doing before.

Mr. Vaughan. As you're aware, we have taken a certain number of those wastes over the last 6 or 8 years under research and development authority, and to be very truthful with you, we have about run out of the amount of research and development we can validly do on those, being reasonable stewards of the taxpayers' money.

Mr. LUJAN. Isn't decommissioning a valid research and development activity? After all, we will have a great number of facilities that we will have to decommission.

You know, you don't need to respond to that. It obviously is a question of how one wants to interpret that. And I understand you have pushed it as much as you felt that you should, except that we still have a problem.

My question is, where do we go from here? Are you telling me we need a change in the law? What are you telling me? We can't just leave those orphan wastes—I guess the expression is hanging in the wind.

Mr. VAUGHAN. We are continuing to work with the NRC, and I think between the two agencies, we do need to be responsive to the need for either how to handle it within regulations or, if a change in the law is needed, to help effect that.

Mr. RUSCHE. I wanted to add one comment, if I may, please, sir. The general question of that intermediate body of materials, waste, if you care to call it that, is something that has got to be dealt with. The Nuclear Waste Policy Act, as you well noted, did not provide the authority for us to accept that material unless it is called high-level waste.

It is through this interaction and the authority provided to the NRC under the act that we need to get the definitions and the appropriate risk-based treatment for those materials identified. It's obvious that the Congress could take some view and perhaps put in place some statute that would provide another mechanism.

But, I think, from a technical standpoint, we've got to get an understanding of what it takes to protect the public against these wastes and then how do we go about doing it? And the place that rests now, I think, is with the Commission.

Mr. LUJAN. What you're then telling me is that for right now, and I hate to look at the legislative solution, because, as you know, it takes forever, to get something like that done.

So what you're telling me is that if you can get together with NRC and come up with a satisfactory definition, between the two of you, that then DOE could begin accepting those tru wastes, and we would have the problem solved?

Mr. RUSCHE. It's the first step, the definitions and the appropriate treatment, that is, the kind of disposal technique, that is required to protect the public. I think we have made the first step.

We then have to look at how do you fund it and who has the responsibility. I think that, when we have the first definition in place, the other two will come much quicker.

Mr. LUJAN. I'm sorry, Mr. Chairman, I don't mean to be taking so much time, but the funding, it's full cost recovery, isn't that correct?

Mr. RUSCHE. If it's called high-level waste, then we dispose of it under the Nuclear Waste Policy Act, you're exactly right.

Mr. LUJAN. And we've done some, have we not?

Mr. RUSCHE. Correct. If it comes under the act, it becomes a very simple matter. The question we now have to deal with is whether it's high-level waste. And that's a definitional threshold we've got to get through. If it is to be treated in that manner, that assumes a certain type of protection, a certain type of cost associated with it which may be unnecessary.

I think that's why we've got to get through this first stage.

Mr. LUJAN. Would you be willing to meet with those who have that problem and see what can be worked out?

Mr. RUSCHE. Of course. We're always willing.

Mr. LUJAN. Thank you.

Mr. RUSCHE. Thank you, sir.

The CHAIRMAN. Mr. Seiberling.

Mr. SEIBERLING. Thank you, Mr. Chairman. Going back to where I left off discussing the members of the board that are reviewing the AVLIS and centrifuge technologies, how many of the people on the board have backgrounds in actual production or manufacturing?

Mr. VAUGHAN. Mr. Seiberling, I cannot precisely answer that question in terms of their direct manufacturing experience. We will be glad to supply that for the record.

[EDITOR'S NOTE.—A list of the membership of the Process Evaluation Board [PEB] may be found in appendix I. See table of contents for page number.]

Mr. SEIBERLING. The reason I asked is because it's one thing to have experience in the laboratory, and it's another thing to know what happens when you try to scale these processes up to a commercial scale. As we usually find out, we learn a lot of things between the lab and the factory.

And I would hope that members of that board have some people who have a sense of the practicalities of putting these things into commercial scale operation. The only technology that's been in that category, of course, is the centrifuge process. And it seems to me that if you don't have the AVLIS technology developed to the same degree, you are comparing apples and oranges to some extent in evaluating the two.

Mr. VAUGHAN. Mr. Seiberling, I think, first of all, the thing that's important is that this Performance Evaluation Board of seven people is clearly not working in a vacuum. They have a number of contractors supporting their effort, which does include the practical manufacturing expertise that you describe. They are certainly attempting to consult and listen to the pros and cons of how well proven the various technologies are, for the reason of needing reliability testing both on the advanced, so-called, SET-V, advanced gas centrifuge machines, which have not been run for long-term testing, as well as for the scaling up of the AVLIS process. And we will need some demonstration time for the selected technology before we do commit to a long-term deployment decision.

Mr. SEIBERLING. I realize that the contractors are involved with the process, but they're not on the board making the final recommendation. Could you supply us information on the past employment of the members and their positions with their employers? So we can get a feel for just what the various qualifications are of the members of this board?

Mr. VAUGHAN. We would be happy to supply that for the record. I just don't have that in my head.

[EDITOR'S NOTE.—The information requested by Mr. Seiberling has previously been furnished by the Department in response to a prior question from Mr. Seiberling. The response may be found on page 186.]

Mr. SEIBERLING. Returning to prehearing question 4-A, which asks the basis of the Department's decision to delay the 1987 advanced technology deployment date until 1989, you explained there hasn't been a final decision on what the target deployment date is. That's news to me.

I thought it was going to be 1989. But the answer doesn't really give us the specific reason for this. It merely says that they were provided because they weren't consistent with the revenue crisis.

Are there some specific reasons for that delay that you can tell us?

Mr. VAUGHAN. First of all, we have had the proponents of both technologies present various near-term and longer-term deployment scenarios. You can't evaluate an infinite number of cases, so we picked a couple of typical cases. The question on when you deploy is going to be based on a number of factors in terms of the demand, the marginal cost of production in existing plants, the amount of capital that we feel the Government is able to invest in building a new plant, or the objective of achieving some private sector participation to invest in those plants.

Mr. SEIBERLING. Those are still generalities. A year ago, you were going to go ahead with continued deployment of the gas centrifuge. Then, last December, we heard that you were going to delay it.

Why? What happened to change your mind? That's all I'm asking.

Mr. VAUGHAN. First of all, and I need to clarify this, the revised centrifuge deployment scenario does have about the same total estimated cost as the prior plan, and it's not one that's more expensive.

Mr. SEIBERLING. But it won't raise the cost?

Mr. VAUGHAN. We don't anticipate any significant raise in cost due to that.

Mr. SEIBERLING. So it won't militate against the centrifuge technology because of the higher cost?

Mr. VAUGHAN. No. When we started, about 1 year ago, we were trying to make a transition between the concepts that used SET-III's in the building being built in Portsmouth, OH, to a design that would go to an intermediate type of centrifuge, called SET-IV's, and then to go to a 4 building plant using SET-V's.

We thought it might be a logical approach in the beginning. As you heard me comment earlier, this technology selection process has had a benefit to the total enterprise in that it has driven down the cost of the gaseous diffusion plants. They have come up with some imaginative solutions. The price competition has become more intense than we predicted.

Mr. SEIBERLING. But the driving down of the cost was primarily because of lower electricity rates.

Mr. VAUGHAN. Part of it is because of lower electricity rates, and the capability to learn that they can operate in a variable mode rather than a constant, steady state mode—so that you can produce more when you can buy off-peak power.

Mr. SEIBERLING. But, of course, if you could do that with centrifuges, electricity costs would be almost infinitely less, wouldn't they?

Mr. VAUGHAN. I'm not sure that they would be infinitely less. I think you need to remember that, if you look at our budget, the electricity costs, which are the bulk of the budget, almost half—certainly, 40 percent of those costs—are for demand charges for power we don't take through an old contract with TVA.

Mr. SEIBERLING. If you went with the centrifuge plan or approach, would you still have to pay those take-or-pay charges? Or would you renegotiate?

Mr. VAUGHAN. Unless we could renegotiate with TVA, we are committed to that contract through 1995. The demand charges for the power not taken are not really a factor in the choice because, as you know, we are operating the gaseous diffusion plants now at about 40 percent of capacity.

So there's going to be power contracted for that we don't need, no matter what scenario.

Mr. SEIBERLING. It seems to me that if you went to the centrifuge process, it would reduce your requirements by 95 percent, or something like that, and it would be absolutely unconscionable for TVA not to renegotiate the whole deal. Certainly, Congress would have some say on that, I would think.

Mr. VAUGHAN. I think where we are, Mr. Seiberling, is that it is probably premature to evaluate the pros and cons of a decision we do have to make this May, which is going to be concluded on the basis of the tradeoffs of a number of factors, both near-term and short-term economics. We're going to have to try to weigh those carefully. I think it would be premature for me to sit here and speculate on the outcome when we've got a group trying to do a very rigid, careful review of that subject.

Mr. SEIBERLING. Well, I interrupted you on your review process. Was there anything more that you were going to add?

Mr. VAUGHAN. Other than to say that we are trying to make a careful evaluation of what we can and cannot spend due to the constraints of revenues, the capacity we've got, and the competitive environment.

Mr. SEIBERLING. Is that the real reason? Wasn't the main reason that your forecasts of demand were reduced and, therefore, your anticipated revenues? Wasn't that a primary reason for the delay?

Mr. VAUGHAN. The forecasted demand in the next 2 years is lower than we had projected, although the forecast of demand over the next 10 years, which is where we've really got to look at this total enterprise, is greater than we would have projected 1 year ago.

Mr. SEIBERLING. The short-term falloff.

Mr. VAUGHAN. That is one of the factors, that is correct.

Mr. **Seiberling**. Could you give us for the record your anticipated demand and revenues over the next 10 years?

Mr. **Vaughan**. Yes.

Mr. **Seiberling**. And any explanation as to changes in your previous forecasts?

Mr. **Vaughan**. We'll be glad to supply that to you.

[Editor's note.—In response to Mr. Seiberling's question, the Department subsequently supplied the following information:]

Projection of DOE Enrichment Sales and Revenues

FY	Sales (millions of SWU)	Revenues[1] (millions of $)
1986	10.1	1364
1987	9.4	1137
1988	10.7	1220
1989	11.8	1263
1990	12.0	1200
1991	14.0	1358
1992	14.4	1354
1993	16.0	1456
1994	15.2	1338
1995	15.3	1301

1/ At projected market prices these revenues are slightly different from the revenues contained in annual budgets because of the Government-provided revenues and some miscellaneous adjustments.

Projected DOE SWU Sales

FY	December 1983 Sales (millions of SWU)	December 1984 Sales (millions of SWU)
1986	11.6	10.1
1987	9.2	9.4
1988	8.4	10.7
1989	8.8	11.8
1990	13.6	12.0
1991	18.8	14.0
1992	19.1	14.4
1993	19.2	16.0
1994	18.5	15.2
1995	18.7	15.3

WHAT CHANGED SINCE 1983

o The U.S. dollar has strengthened, putting increasing downward price pressure on DOE.

o DOE's projections of nuclear growth have been revised downward to reflect plant terminations, slower than expected plant construction schedules, and deferral of new plant orders.

o DOE has lost 14 of its 86 customers during the conversion to the US contracts

o Given the current price pressures, and the fact that DOE's price is 40% higher than the competition, customers have elected to keep 30% of their requirements uncommitted to any supplier in the post-1990 timeframe.

o In summary, the projected DOE SWU sales and market prices are both lower than were projected in 1983 thus resulting in substantially lower sales and revenue projections through the turn of the century.

Mr. **Seiberling**. Why is DOE starting to pay back the Treasury for construction costs of the original facility? What effect will this have on the price of uranium to the consumer?

Secretary Herrington? Mr. Vaughan?

Mr. **Vaughan**. We've been requested by the Office of Management and Budget, who somewhat acts like our banker——

Mr. **Seiberling**. They're in the banking business now as well as everything else.

Mr. **Vaughan**. To evaluate as a part of the overall budget picture how much we would pay back against the invested capital in those plants. We have committed to make a critical evaluation of that and identify how much we think is appropriate, balanced against the other costs of the enterprise.

Mr. **Seiberling**. What will be the effect on the price of enriched uranium that you have to charge?

Mr. **Vaughan**. I do not have a precise number for that but we still intend to be able to get the price of the enriched uranium down rather than up. We do expect in the next year to meet our commitment of offering prices for our enrichment services that are below the $135 ceiling that is now set in the new utilities services contract.

Mr. **Seiberling**. All right, now just a couple more questions. What are the expected employment levels at Portsmouth, Oak Ridge, Akron, and Sandusky at the present time, and after the May 1985 decision?

In other words, the 2-year delay will affect employment levels at these various places. Do you have any figures on that?

Mr. **Vaughan**. In the written response that we provided today, we gave you the current levels of employment. I think it would be premature for me to speculate on the levels of employment after the May decision, because that would include how long we are going to continue to operate the existing plants. Since we haven't made that decision, it's hard to speculate on the shift in employment.

Mr. **Seiberling**. I'm looking at your response to question 5 of the prehearing questions, and I question some of the information there. For example, it shows under the table showing current Government and contractor employment levels for uranium enrichment, it says: "Technology R&D Centrifuge Development: Garrett and Torrance, California, 200."

Does Garrett have no research employees in Sandusky, OH, or is that just a production facility that doesn't do any R&D?

Mr. **Vaughan**. We have the people in Sandusky included in the GCEP line under 15 contractors, at various locations.

Mr. **Seiberling**. That's the capability of centrifuge?

Mr. **Vaughan**. Yes, and getting ready to operate the plant.

Mr. **Seiberling**. I see. I guess that answers my next question. You show only 60 at Goodyear under centrifuge development when actually, in Akron, they have about 450 people working. I guess the other 390 are up under the gas centrifuge plant figures. Is that correct?

Mr. **Vaughan**. In drawing the distinction in the tables, and it's a difficult one to draw, under technology R&D, we have included those people working under what is colloquially called AGC, the advanced gas centrifuge, or the so-called SET–V machines. Those are the Goodyear people under the technology R&D category.

The remainder are included in the above line for the people working on the gas centrifuge enrichment plant that's under construction.

Mr. SEIBERLING. All right, I just have a couple more, I guess. One, will the MITRE Corp. report on technical uncertainties in the advanced technologies be made public before the process through which the board makes its final decision?

Mr. VAUGHAN. It does not plan to make it public before the PEB selection. It's part of the decisionmaking process. It also is a classified report.

Mr. SEIBERLING. Will it be made public at the time of the decision?

Mr. VAUGHAN. It can't be made public because it's classified. You will remember, and you well know from Portsmouth, that we've got a "top end" for military needs as well as our civilian customers, but it can be made available to the people that have a need to know and, certainly, any Member of the Congress or your staff would certainly be welcome.

Mr. SEIBERLING. I appreciate that but can you declassify the parts that aren't really sensitive, and release that?

Mr. VAUGHAN. Mr. Longnecker, who is sitting behind me, and who is my deputy for uranium enrichment tells me that a portion of the mitre report will be unclassified and made available after the technology selection in May 1985.

Mr. SEIBERLING. Mr. Chairman, I have several additional questions. But if I could have the time for just a couple more, I would appreciate it.

Your testimony anticipates further reductions in costs for the enrichment enterprise, which will presumably be reflected in the lower price. Where do you expect these cost reductions to come from?

Mr. VAUGHAN. Among other things, they will come from continuation of improved operating efficiencies. For example, this year, we used off peak power at one of the three plants and we anticipate then going to that method of operation at the other two plants, now that we've demonstrated that that's a reliable way to provide the services.

Mr. SEIBERLING. How will the delay of 2 years, or whatever it is, affect your efforts to compete with foreign producers? You answered that in general terms in your answer to question 5–B. Can you tell us more specifically?

Mr. VAUGHAN. Hopefully, it will enable us to be equally, if not more, competitive than we otherwise would have been if we had gone to a prompt deployment scenario. We could have foreseen up to $800 million in outlays over the next 2 years. So that, we believe, will be saved.

Mr. SEIBERLING. But your operating costs would be higher?

Mr. VAUGHAN. Not necessarily, because I don't believe you could fully build and put any advanced technology plant into operation in precisely a 2-year period. And, as the Secretary commented in his opening statement, neither the SET–V machines nor the AVLIS have gone through the reliability testing that we think is essential to making sure that before we make a deployment decision we've got a "pump," if you please, that will operate reliably rather than just instantaneously deliver a certain number of gallons per minute at a certain amount of head and flow.

Mr. SEIBERLING. Hasn't that been pretty well demonstrated? You wouldn't have sunk $2 billion into this plant, it seems to me, unless the reliability of the machines had been demonstrated.

Mr. VAUGHAN. We are planning to begin experimental operation of the GCEP Program with the SET-III machines this coming April. My previous answer to your question was referring to the longer term deployments on the advanced SET-IV machines, or the AVLIS, whichever is the selected technology.

Mr. SEIBERLING. Finally, what will happen to the Portsmouth GCEP facility should the advanced gas centrifuge not be finally selected? You put $2 billion into it. Are you going to walk away from it?

Mr. VAUGHAN. That's a choice we'll have to make and have not yet made.

Mr. SEIBERLING. Thank you.

The CHAIRMAN. Thank you. We appreciate having you with us this morning, Mr. Secretary.

Secretary HERRINGTON. Mr. Chairman, thank you very much.

The CHAIRMAN. You've acquitted yourself very well.

Our final witness today is Mr. Kevin Boland. Mr. Boland, we have your prepared statement. It will be placed in the record in full. Summarize it and tell us what we need to know.

[Prepared statement of Hon. F. Kevin Boland, with attachment, may be found in appendix I.]

STATEMENT OF HON. F. KEVIN BOLAND, SENIOR ASSOCIATE DIRECTOR, RESOURCES COMMUNITY AND ECONOMIC DEVELOPMENT DIVISION, GAO, ACCOMPANIED BY MARY CHESTON AND JOHN TAVARES

Mr. BOLAND. Thank you, Mr. Chairman. First, I'd like to introduce some colleagues with me today, Mary Cheston and John Tavares, who are responsible for much of the work that is included in the reports I will discuss today.

We appreciate this opportunity to be here today to discuss the Department of Energy's efforts to implement the Nuclear Waste Policy Act of 1982. As you know, the act requires GAO to report to the Congress on the results of an annual audit of DOE's Office of Civilian Radioactive Waste Management. Also, at the request of the Senate Energy and Natural Resources Committee, we prepare quarterly status reports on these program activities. My testimony today, which I will highlight, is based on our recently-issued annual and quarterly reports.

Overall, we have found that DOE has made significant progress toward implementing major legislative requirements. DOE, however, faces a difficult challenge in meeting repository siting deadlines mandated by the act, ensuring adequate financing for the high cost of the program, and enhancing management controls over repository planning and execution.

In regard to program financing, we noted the potential for earlier collection of millions of dollars in user fees and our January 1985 report made specific recommendations to the Secretary of Energy to reexamine program financing arrangements.

Some comments on the siting of waste repositories. In this area, DOE has taken several important steps toward finding a suitable location for the Nation's first high level waste repository. Some of those accomplishments we heard from the Secretary this morning.

Briefly, in February 1983, the Secretary of Energy notified six States that they contained nine locations which DOE would further evaluate. These were Louisiana, Mississippi, Nevada, Texas, Utah, and Washington.

In December 1984, DOE issued general guidelines for siting nuclear waste repositories, and they will use these guidelines to evaluate the suitability of candidate sites. The guidelines specify conditions on such matters as geohydrology and population density that qualify or disqualify any site from development as a repository.

Also in December 1984, DOE announced its intent to propose to the President three sites in Nevada, Texas, and Washington State, for detailed onsite tests. The draft environmental assessments on each of the nine candidate sites formed the basis for DOE's preliminary site proposals. They are undergoing public review and comment before being finalized, and before the Secretary of Energy makes a formal recommendation to the President.

The act required the Secretary of Energy to make his recommendation not later than January 1, 1985, but DOE does not expect to be in a position to do so until at least mid-1985.

Legal challenges could affect DOE's progress in siting the Nation's first waste repository. Beginning in December 1984, at least four lawsuits have been filed by States, private associations, and individuals in reaction to DOE's siting activities. As of mid-February the courts have not addressed the merits of the suits.

Financing this program which I mentioned in my opening comments is another issue we've looked at. We believe that DOE should fully evaluate ways to more promptly collect fees from all anticipated users of its repository services. DOE has established procedures for the collection and payment of fees for spent fuel owned by the Nation's utilities and other commercial owners. However, DOE has not done so for the high-level waste produced by DOE defense programs—these account for about 98 percent of the high-level wastes in the United States—and those maintained by New York State—which accounts for the remaining 2 percent.

On the basis of our analysis of DOE's fee collection procedures or plans, we found that DOE may be able to accelerate millions of dollars of payments from these anticipated repository users and, as discussed in detail in my written statement, it's difficult to make a firm estimate of the additional revenues that would accrue to the Nuclear Waste Fund. However, each possible way of accelerating payments that we analyzed has possible obstacles or concerns DOE would need to address.

We did recommend to the Secretary of DOE that he evaluate ways to more promptly collect fees from all generators and owners of highly radioactive materials and establish fees for the disposal of high-level waste owned by the Federal Government and for those wastes maintained by New York State. DOE said it is exploring alternatives to improve the program's revenue stream and that our recommendations were under study.

Some brief comments on program organization. DOE has put in place a headquarters office to direct the overall program. However, its managers do not have the authority to directly control the field staff who execute the program through a multitude of contractors. Field staff are assigned, controlled, and evaluated by managers in DOE's field offices. For fiscal year 1984 about half the 191 staff year ceiling was allocated to three DOE field offices. These offices, during fiscal year 1983, obligated under 228 prime contracts or subcontracts, almost 90 percent of the programs, $254 million in available appropriations.

Under this decentralized field management approach, which we found typical of most DOE programs, the DOE Waste Office will need to pay particularly close attention to developing strong management controls over repository planning and execution. The DOE Waste Office recognizes the importance of this consideration and has taken actions to strengthen its controls over repository planning and execution.

For example, beginning in fiscal year 1985, DOE upgraded its capability to collect more detailed cost data on program subactivities. Moreover, DOE is in the initial stages of designing a program-wide planning and control system as a means to measure actual performance in accomplishing technical, cost, and schedule objectives.

Before concluding my remarks, Mr. Chairman, members of the subcommittee, I'd briefly like to note a few additional program activities required by the act that could set the program's pace and direction for many years to come. These are: the Department's mission plan, anticipated to be submitted to Congress this May; and the Department's proposal for the construction of Government storage facilities, commonly referred to as MRS, which is due to the Congress this June.

We will continue to monitor and evaluate selected activities and program initiatives of DOE's Waste Office through forthcoming annual audits and our quarterly status reports and we'd be pleased to answer any questions at this time.

The CHAIRMAN. Thank you.

One of the wise things we did provide for in the Congress was the regular GAO review of progress in the waste program. I think the report you've made is most helpful and useful and justifies the expenditure of time and staff activities. I have a considerable number of questions but I think, in light of our time problem today with legislation on the floor, we'll have to pass. I don't have any colleagues; I'm all by myself, so I think I'll adjourn the hearing. Thank you very much.

[Whereupon, at 12:15 p.m., the hearing was adjourned.]

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DEPARTMENT OF ENERGY AUTHORIZATIONS FOR FISCAL YEAR 1987

FRIDAY, FEBRUARY 7, 1986

House of Representatives,
Subcommittee on Energy and the Environment,
Committee on Interior and Insular Affairs,
Washington, DC.

The subcommittee met, pursuant to call, at 10 a.m., in room 1310, Longworth House Office Building, Hon. Sam Gejdenson presiding.

Mr. Gejdenson. The hearing will come to order.

I will read the first paragraph of the statement of the chairman, Mr. Udall, and I think both of you gentlemen are aware of his general concerns and the committee's concerns.

Today the Subcommittee on Energy and the Environment will receive testimony on the Department of Energy's budget request for certain nuclear energy activities during fiscal year 1987. DOE activities within the subcommittee's jurisdiction include several energy supply research and development programs, the uranium enrichment enterprise, and activities under the Nuclear Waste Policy Act of 1982.

We are pleased to have with us this morning James W. Vaughan, Jr., Acting Assistant Secretary for Nuclear Energy, to discuss the Department's energy supply, R&D, and uranium enrichment activities, and Ben C. Rusche, Director, Office of Civil Radioactive Waste Management, to discuss high-level waste programs.

If you gentlemen care to begin.

[Prepared statements of Hon. James W. Vaughan, Jr., with attachments, and Ben C. Rusche may be found in appendix II.]

PANEL FROM THE U.S. DEPARTMENT OF ENERGY CONSISTING OF HON. JAMES W. VAUGHAN, JR., ACTING ASSISTANT SECRETARY FOR NUCLEAR ENERGY; AND BEN C. RUSCHE, DIRECTOR, OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

Mr. Vaughan. Mr. Chairman, I am James Vaughan. I will begin first, and then Mr. Rusche has a separate statement.

I am pleased to be here today to discuss the Department's fiscal year 1987 nuclear energy programs involving our remedial action and low-level waste efforts, and our uranium enrichment enterprise.

I have provided both a detailed written statement and responses to the questions on uranium enrichment which were posed in your letter of invitation, and I would request that these be made part of the hearing record.

Mr. **Gejdenson**. Without objection.

Mr. **Vaughan**. Our fiscal year 1987 budget request for both of these activities is tabulated in my written statement. The fiscal year 1987 funding request for our Nuclear Energy Supply Research and Development is $626.8 million in budget authority, as compared to $607.4 million estimated in fiscal year 1986. I would note that all of the fiscal year 1986 figures in my statement and those to which I will refer orally reflect appropriated totals which have been reduced by the sequestrations responsive to the Gramm-Rudman-Hollings Deficit Reduction Act, management initiatives, and other general reductions. The fiscal year 1987 uranium enrichment budget request reflects planned offsetting revenues and partial payback of prior Government investment resulting in a net zero appropriation for that activity.

The Department of Energy continues to place high priority on ensuring that nuclear energy contributes to a strong, stable, and secure national energy base to meet both civilian and military requirements. Our commitment to nuclear energy remains strong, and our execution of a reliable, competitive, and businesslike uranium enrichment enterprise is an integral part of that commitment. The Department also remains strongly committed to protecting public health and safety and to assuring a safe and clean environment in connection with its activities. Our remedial action and waste technology efforts are an integral part of that commitment.

In fiscal year 1987 there are several shifts in emphasis within the nuclear energy budget. Within an essentially level budget compared to fiscal year 1986, our funding request for nuclear energy research and development has decreased about $46 million, while funding for remedial actions and waste technology—including low-level waste activities—has increased by some $64 million.

There are several key factors that have influenced these shifts in program priorities:

First, the Department is fully committed to support the bipartisan effort to control and reduce the Federal deficit, and while it may appear to some that some worthwhile R&D elements have been eliminated or significantly reduced, we believe that each of our programs is sharply focused to make optimum use of our limited resources.

Second, space and defense nuclear energy needs are increasing, particularly those associated with the strategic defense initiative, a top national priority. Accordingly, our funding request for these efforts in our nuclear energy R&D programs have increased in fiscal year 1987.

Third, the currently anticipated timing for the commercial introduction of innovative reactor technologies beyond light water reactors has stretched out. Accordingly, our funding requests for civilian advanced reactor development activities have been reduced in fiscal year 1987 consistent with this stretched-out timing and other nearer-term priorities, including our space and defense nuclear energy activities.

Fourth, the remedial action and waste technology budget request does increase significantly compared to the fiscal year 1986 estimate, but less than previously forecast. The program objectives can be achieved at this level of funding by extending the authorization period for the Department's Uranium Mill Tailings Remedial Action Program from March 1990 until the end of fiscal year 1993, consistent with the guidance which was provided in the House report accompanying the fiscal year 1986 Energy and Water Development Appropriations Act. Emphasis in all remedial action programs will concentrate on cleanup activities at highest priority sites and the continued protection of the public and the environment at all sites.

Finally, the uranium enrichment budget request reflects several strategic decisions made by the Department during the past year. Chief among these are placing the Oak Ridge Gaseous Diffusion Plant in standby, termination of the gas centrifuge enrichment plant project, and selection of the atomic vapor laser isotope separation process, commonly called AVLIS, as the uranium-enrichment technology for the United States in the 21st century. During fiscal year 1986, the Department will initiate an effort to involve the private sector in AVLIS research, development, and demonstration on a cost-sharing basis.

Turning now specifically to our Remedial Action and Waste Technology Program, I would first note that my detailed written statement contains information on each of the projects underway in this program. I will briefly discuss two areas of particular interest to this subcommittee—the uranium mill tailings remedial action project and our low-level waste activities which will help implement the Low-Level Radioactive Waste Policy Amendments Act of 1985 that this subcommittee was instrumental in enacting.

The uranium mill tailings remedial action project is responsible for conducting these efforts at 24 former uranium-ore processing sites and several thousand contaminated vicinity properties. Nine of the sites are designated as high priority, six as medium priority, and nine as low priority.

The proposed 2½-year extension of this project takes into consideration the actual project experience gained in performing remedial action at several processing sites and many vicinity properties. Project plans have been revised to reflect this experience and more level funding and work loading among the projects. Within these plans, work will continue first at the high-priority sites with very minimal planned extension in previous schedules for these sites.

The Department's Low-Level Waste Program provides assistance to States and regions in developing capacities for the disposal of low-level radioactive waste, in accordance with the recent act. The goal of the Department's Low-Level Waste Program is to assist the States and regions in the development of an effective nationwide low-level waste management system. The act has also assigned several new responsibilities to the Department in addition to providing this assistance.

During fiscal years 1986 and 1987, we will conduct activities required by the act and will focus primarily on meeting the generic technical needs of the States and compact regions as they work to select sites and develop new disposal facilities and to evaluate alternative disposal technologies. The report identifying options for the Congress on disposing of greater than Class C low-level wastes will be completed in January 1987 as requested by the act.

I would like to next discuss our uranium enrichment enterprise. Your letter of invitation specifically requested the Department's views on the requirements of the Atomic Energy Act relative to enrichment pricing and to the domestic uranium industry. I have appended to my written statement a copy of our "Notice of Proposed Rulemaking" that was published in the Federal Register on January 29, 1986. Let me simply note that the Department's views on this particular issue are best summarized under the "supplementary information section" of our proposed modification to the uranium enrichment services criteria.

In the past 2 years, significant progress has been made in redirecting the uranium enrichment enterprise to assure its competitiveness and long-term viability in both the domestic and international marketplace. Supply and demand have been stabilized by issuing the utility services [US] contracts and by successfully converting existing customers to the new contracts. Having defined this customer demand that must be met, the Department then developed appropriate production and research and development strategies to meet that demand and announced those decisions last June. During the next 2 years the restructuring of the enterprise which began in 1984 will continue.

A new initiative beginning later this month will be an effort to involve the private sector in uranium enrichment to the maximum extent possible. The areas in which the private sector can most beneficially be involved in the enterprise will be defined by the response to a request for expressions of interest that will be issued later this month. At a minimum, it is hoped that the private sector will be interested in supporting the deployment of the AVLIS technology. In that light, the Department will initiate, during 1986, an industrial access program to allow qualified U.S. firms to become familiar with the AVLIS technology so that there is an assured industrial base to deploy this technology in the future.

One issue that has received a considerable amount of attention recently is a decision issued by the U.S. District Court for the District of Colorado regarding the utility services contracts. While we cannot make any detailed comments on this litigation, the Department believes that the utility services contracts are legally valid and consistent with the existing uranium enrichment services criteria. As such, it is our belief that the individual utility services contracts executed between DOE and its individual customers remain a valid basis for business transactions, and that this view will be upheld on appeal.

We anticipate that the current rulemaking process to modify the uranium enrichment services criteria will be completed this summer. All interested parties will have the opportunity to comment on the proposed criteria change in writing and at a public hearing which we will convene in Washington, DC, on March 18 and 19. DOE will then submit the new criteria to Congress at least 45 days prior to their actual effective date.

A crucial element of the competitive strategy in the uranium enrichment enterprise is our approach to pricing. The market is extremely price sensitive and DOE prices simply must be more competitive. The key to the health of the U.S. uranium enrichment business is to continue our effort to get near-term prices down into the competitive range by aggressively reducing our costs.

The price for U.S. contract holders in 1985 was $135 per separative work unit. On October 1, 1985, a price reduction to $125 per separative work [SWU] unit became effective. This price is still significantly higher than those currently offered by our competitors. Accordingly, DOE plans to continue its price reduction policy by offering fiscal year 1987 base price of $119 per separative work unit effective on October 1 of this year. This will represent about a 5-percent price reduction from our present charge for enrichment services.

This declining pricing pattern for the United States adds credibility to plans for even lower prices in the future. Not following a competitive pricing strategy could have serious impact on the enterprise. For example, it is estimated that the Department would lose about $7 billion in revenues between now and the year 2000 if it were to keep prices at the current $125 per separative work unit level. Thus, our pricing policy is crucial to the competitive strategy.

In April 1985, the Department offered an incentive price of $90 per separative work unit to customers with uncommitted sales in fiscal year 1987 through 1990. This incentive pricing offer proved very successful; DOE sales for this period, fiscal year 1987 through fiscal year 1990, were increased by 14 percent, or over 5 million separative work units.

By April 1, 1986, DOE customers must decide how much of their fuel supply they will take from the Department during fiscal year 1991. Over 25 percent of our U.S. contract enrichment demand is uncommitted from fiscal year 1991 through fiscal year 1995. So there are total sale opportunities with a sales value of about $2 billion during that time period.

With that background, in light of our previously highly successful incentive pricing effort, DOE has now made a fiscal year 1986 incentive pricing offer to its customers. In return for commitments by those customers to purchase 100 percent of their enrichment requirements from DOE in the 5-year period from fiscal year 1991 to fiscal year 1995, DOE has proposed a price of about $85 per SWU for the top 30-percent fraction of those requirements. The remaining 70 percent of the customers' enrichment requirements would be priced at the DOE base price.

If successful, this post-fiscal year 1990 incentive price extension will increase DOE's market and revenues, discourage competitor investment in new capacity, improve U.S. trade balance, prevent competitor penetration of DOE's market share, and effectively utilize excess DOE production capacity. In addition, a larger sales volume to DOE will result in lower unit production costs which could then be passed along to all customers in the form of lower prices.

I would also like to note that after extensive discussions, the Office of Management and Budget and the Department have developed a mutually agreeable approach to handling the matter of annual payments to the Treasury to offset the Government's unrecovered investment in the uranium enrichment enterprise. These costs will be recovered in a manner that will assure the commercial and military customers will continue to obtain competitively priced enrichment services.

Basically, under this formula, writeoff of the unproductive portion of the gas diffusion plants and the entire gas centrifuge enrichment plant will be reflected in DOE's 1985 uranium enrichment financial statement. As a result, the level of outstanding Government investment will be established at $3.5 billion. In addition, interest on this account will be based on the average historical long-term Government borrowing rate. This will have the effect of lowering the imputed interest rate. DOE and OMB will mutually establish annual payment goals; we plan to begin repayment with $110 million in 1986 and $235 million in 1987.

Finally, I would like to comment briefly on three areas of our Light Water Reactor Research and Development Program, in which the committee expressed specific interest. These are the Three Mile Island research and development effort, the Extended Fuel Burnup Program, and the Loss-of-Fluid Test Program.

The objectives of our Three Mile Island activities are to develop the technology that will improve the capability of civilian nuclear powerplants to safely recover from accidents and to conduct relevant research and development that will substantially enhance the nuclear powerplant safety and operation.

Recent examinations and analyses have indicated that a substantial quantity—up to about 20 tons—of core material is in the bottom of the reactor vessel. The current general public utilities schedule projects the completion of fuel removal from the original core region by the end of fiscal year 1986, and removal of the remaining fuel from the bottom of the reactor vessel and from primary system components by the end of fiscal year 1987.

Beginning in fiscal year 1986, the damaged TMI II core will be collected for shipment to the Idaho National Engineering Laboratory for examination and interim storage. During fiscal year 1987, DOE will terminate its onsite activities at the island. Other efforts in fiscal year 1987 will be to begin the offsite examination of the damaged core and the transfer of this technology to industry.

Efforts over the last 10 years in our Extended Fuel Burnup Program have provided benefits to the participating utilities. Consistent with Public Law 99-141, the Department has now initiated closeout of Federal involvement in this program. During fiscal year 1986, Federal involvement will be completed in 6 of the 11 extended burnup projects, and 3 of the balance of 5 will have enough carryover funds to be brought to orderly completion. The results available to date have already provided a capability to extend the lifetime of fuel by about 35 percent, with the attendant benefits. So the focus will then shift to fuel suppliers and utilities to build upon these efforts, and to the State public utility commissions to recognize sufficient incentives for longer life fuel in the economic rate base.

Turning now to the Loss-of-Fluid Test [LOFT] Program, I would simply note that fuel damage testing conducted during prior years culminated in a very successful completion of the reactor testing portion of this LOFT Program in fiscal year 1986. A critical task under our light water reactor safety efforts is continuing the Severe-Accident Technology Program in fiscal year 1987, including post-irradiation examination of the damaged fuel from LOFT as well as that from TMI, both in cooperation with international partners. The focus of our fiscal year 1987 activities will be the performance of various technical analyses, including technical consensus on models and data for light-water reactors.

The goal of all these efforts is to develop and apply a severe-accident methodology incorporating the results of all recent experimental work and incorporating and understanding of the ability of operator actions to reduce the consequences of accidents at a nuclear powerplant through more informed decisionmaking. Effective consensus in this area is crucial both to the regulatory reforms we are seeking and to achieving a better understanding of the requirements for emergency preparedness at both the local and Federal levels.

Mr. Chairman, this concludes my oral remarks. I have several members of the Department that are involved in these activities available, and we would all be pleased to respond to your individual queries. You may wish to hear from Mr. Rusche, with his prepared statement, and then inquire of us collectively or separately. We are prepared to proceed as you wish.

The CHAIRMAN. I think what we will do is hear Mr. Rusche with his statement or a summary of it, and then we will go to questions from the members.

Before you begin, I apologize for being late. I had an opening statement. The initial part was read by Mr. Gejdenson in my absence. I will insert my opening statement in the record as the questioning proceeds.

Dr. Rusche, we would be glad to hear from you at this time.

Mr. RUSCHE. Thank you, Mr. Chairman and members of the subcommittee. I am pleased to appear before you today to present the fiscal year 1987 budget for the DOE's Office of Civilian Radioactive Waste Management. I have prepared a more extensive statement which I would like to submit for the record, and at this time provide a brief overview and status of the major activities planned for fiscal year 1987 under the Nuclear Waste Fund Program, as well as under the Civilian Radioactive Waste Research and Development Program.

I have earlier provided answers to specific questions to the Department contained in your letter of invitation, and trust that both of these will be entered into the record. Since the NWPA requires the annual submission of a triennial budget under the nuclear waste fund, I will include estimates for fiscal years 1988 and 1989 in my comments as well.

The 1987 budget request for the nuclear waste fund is $769.3 million, compared to $499 million for fiscal year 1986. The estimate for 1988 is $863 million, and for 1989 is $799.2 million.

R&D activities not financed under the nuclear waste fund are funded under the energy supply R&D appropriation in a program entitled "Civilian Radioactive Waste R&D." The 1987 budget request for Civilian Radioactive Waste R&D is $6.5 million, compared to $16 million in fiscal year 1986. The 1986 budget request for authority funded by the waste fund is summarized in table 1 of my prepared statement.

The 1987 budget request for Civilian Radioactive Waste R&D is in table 2.

Under the waste fund, the increased fiscal year 1987 request will provide for extensive site characterization activities to begin exploratory shaft design and construction and to conduct intensive engineering tests and analyses to support the waste package and repository designs for the first repository. These activities will be conducted at each of the three candidate repository sites approved by the President for site characterization. DOE plans to formally recommend three sites for characterization to the President in the spring.

The increase in fiscal year 1987 will also provide for preparation of site field investigations in crystalline rock under consideration for a second repository and design of the second repository. While construction of a second repository is not authorized by Congress, other activities involving siting and design of a second repository are required under the NWPA.

In addition to an increase in the budget related to repository activities, the fiscal year 1987 budget request also represents a significant increase over fiscal year 1986 in activities related to monitored retrievable storage, should Congress adopt the proposal required by section 141 of the NWPA, and which we hope to submit shortly.

I would inject that the decision by the district court in Tennessee is under study, and I hope that we will have a better estimate of its effect on both the timing and the program content within a few days.

The fiscal year 1987 request of $46 million, compared to $3 million in 1986, supports congressional approval to proceed with activities that are critical to the deployment of an MRS facility in Tennessee. In that proposal, DOE will recommend the construction of an MRS in Tennessee to receive, consolidate, and package spent fuel for bulk shipment to a repository. I will later in my testimony discuss a few of the details.

The program proposed to be funded from the nuclear waste fund puts first priority on the first geologic repository and the associated transportation, integration, and management systems. Second priority is given to MRS because of its potential for improving the overall system, followed by a third priority to the second repository siting activity.

Neither the MRS nor the second repository is authorized for construction by the NWPA. But it is clear to us that the MRS offers the earliest and best means for assuring that the objections of the NWPA are carried out and, thus, are priority.

An increase in transportation and systems integration in 1987 is also requested. The 1987 request of $33.4 million compared to the 1986 appropriation of $21.3 million, from the waste fund represents an effort to be initiated during 1986 for the private sector to design, fabricate, and test prototype casks for DOE to consider in developing transportation or shipping spent fuel from reactors directly to a respository or from reactors to an MRS.

The 1987 budget request under the civilian R&D fund of $6.5 million represents a decrease from the 1986 budget of $16 million. Essentially this results from the fact that no funds are being requested for research and development concerning alternatives for permanent disposal of spent fuel and high level waste. During 1986 and in previous years the principal alternative disposal concept funded has been sub-seabed disposal. Activities related to research and development in alternative disposal concepts called for in section 222 of the act are not proposed for refunding after 1986.

Now, let me try to give you a brief summary of the status of the program. The NWPA calls for DOE to site, design, construct, operate and close the Nation's first geologic repository for spent fuel and high-level waste; to site and design a second repository; to submit a proposal to Congress on the need for and feasibility of a monitored retrievable storage facility; to develop a transportation system; and to carry out certain other activities in support of the development of a disposal system. It established a method of disposal—geologic disposal, schedule, technical processes, and a funding mechanism—namely, the waste fund, to ensure successful implementation.

Interwoven throughout these activities is the requirement for an extensive system of interactions providing checks and balances to ensure Federal accountability to the States, affected Indian tribes, the public, the electric utilities, their ratepayers, and the Congress. To ensure the accountability of the Federal Government—specifically, DOE—to the other parties and concerned citizens, we have on many occasions expanded the interactive process beyond that called for in the NWPA, and that has added time to the program. We have been undertaking steps to ensure that the affected States and Indian tribes can provide early input to DOE's decisionmaking processes. For example, we have invited affected States and Indian Tribes to participate in the Office of Civilian Radioactive Waste Management internal coordinating group on socioeconomic and environmental issues, and the first such meeting jointly was held this week, and I might say, to the best of our knowledge, was quite successful.

In spite of these actions, though, DOE is often criticized by many of the affected parties for not providing the opportunity for effective participation. In passing the NWPA, Congress found, and I quote, that:

> State and public participation in the planning and development of repositories is essential in order to promote public confidence in the safety of disposal of such waste and spent fuel.

My reading of that finding is that not only does the Federal Government have to the accountable to the affected and interested parties in the Nation, but so do the other participants. An important part of the 1987 budget request is to fund participation by States and Indian tribes.

I do not believe it is the intent of Congress to fund participation to thwart progress in developing a disposal system that will provide reasonable assurance that the public and the environment will be adequately protected from the hazards posed by high-level waste and spent fuel. Effective participation is, I believe, participation for the purpose of ensuring that the resulting decisions will adequately protect the public health, safety, and environment.

To date, DOE has identified nine potentially acceptable sites for the first repository, prepared draft environmental assessments which propose five of those sites as suitable for site characterization and propose three of the five sites for recommendation to the President for site characterization.

After a lengthy review process and at the suggestion of several commentors, last fall, we requested the National Academy of Sciences Board on Radioactive Waste Management to conduct an independent review of the appropriateness of the ranking methodology—referred to as the utility estimation method.

The NAS Board responded that the methodology, if properly applied, is appropriate, but further recommended that the application of the methodology be reviewed. Therefore, over the last several months, while DOE has been completing final environmental assessments to accompany the formal nomination of sites for characterization and applying the ranking methodology in the recommendation decision process, the NAS Board and DOE have met several times on this subject. We expect to have a final review session in late March.

We consider the review by the NAS Board to be quite valuable in ensuring us, as well as the public, that the decisions being made in the siting process are indeed scientifically and technically sound. Based on our discussions with the Board, we currently expect to issue the final environmental assessments and formally nominate and recommend sites for characterization this spring, hopefully around the end of April. The formal nomination and recommendation will be based on siting guidelines in 10 CFR part 960 of our rules, utilizing available geotechnical, environmental, and other relevant information contained in the EA's, which will accompany the nominations and, accompanied by comments provided by the Board.

In our budget request for 1987, the largest increase is in this account for the first repository from $386 million to $541 for this year, primarily to allow us to begin site characterization activities.

The extensive site evaluation involved in the characterization includes construction of deep, exploratory shafts at the three sites approved for characterization, as well as in situ testing. We plan to construct two shafts at each site, with shaft construction taking about 2 years and in situ tests scheduled to start in fiscal year 1989.

The major milestones association with this program are contained in my prepared statement on page 11.

For the second repository, although construction is contingent upon future congressional authorization, DOE may consider sites identified as potentially acceptable but not nominated for the first repository, sites found potentially acceptable from rock formations not previously studied in the first repository process and sites characterized but not chosen for the first repository.

Rock formations not previously studied in the first process have been crystalline rock. Following national surveys, DOE identified 235 crystalline rockbodies in 17 States in 3 regions of the country. One January 16 of this year, we issued for public comment a draft area recommendation report. The draft proposes from among the 235 rockbodies in 17 States, 12 potentially acceptable sites in 7

States. The seven States are Georgia, Maine, Minnesota, New Hampshire, North Carolina, Virginia, and Wisconsin. The draft also identifies eight other areas in four of the same seven States as suitable for possible further consideration.

Starting Monday, February 10, we will begin holding more than 70 public briefings and hearings in all 17 States to receive comments and input. After review of the oral and written comments received on the draft, we expect to issue a final report, formally identify potentially acceptable sites in crystalline rock and begin the areas phase activities of those areas determined potentially acceptable for the second repository. Area phase activities include onsite investigations to collect and assess geologic, environment, socioeconomic, and transportation data.

Our request for the second repository activities is $78.7 million compared to $35.5 and the increase is principally to fund preparation for the onsite area phase work, which is estimated to take 3 to 5 years. The outyear estimates are $74.2 for fiscal year 1988 and $71.5 for fiscal year 1989, and the milestones leading to these recommendations are on page 14 in the detailed statement.

On MRS, section 141 directs DOE to complete a study of the need for and feasibility of an MRS, and to submit to the Congress a proposal for the construction of one or more such facilities.

In spring of 1985, DOE completed its analysis of the need for and feasibility of and announced our conclusion that such a facility could serve as an integral and important part of the overall waste disposal system.

At that time, we identified a preferred site and two alternative sites, as required by the NWPA. The preferred site is the site of the canceled Clinch River Breeder Reactor in Oak Ridge, TN; and the two alternates are also in Tennessee—one on the Oak Ridge Reservation and the other near Hartsville.

In addition, we completed the need and feasibility studies verifying our tentative conclusions and, Mr. Chairman, we paid special attention to evaluating the no-MRS case as this committee emphasized last spring when you were kind enough to agree to a reprogramming so that this action could proceed.

Over the last 9 months, we have worked closely with Tennessee in our development of the proposal to Congress. This interaction has principally been through Tennessee Governor Alexander's safe growth council. To support their review of the proposal, we provided a grant of $1.4 million. The State in turn provided $100,000 each to the three communities involved. The Clinch River Task Force completed their review in October of 1985 and issued a report entitled "Recommendations on the Proposed MRS." In their report, the task force concluded that an MRS could be safely constructed and operated and under certain conditions would be acceptable in their community.

On January 21, Governor Alexander met with the Secretary and myself to present the State's position on our proposal to construct an MRS at Clinch River. We are disappointed that the Governor does not share our view of the need for and value of an MRS, but are pleased that he, like the Clinch River Task Force, shares our view that such a facility could be constructed and operated safely and is not a substitute for a permanent repository.

In our proposal, which we will hope to have for the Congress shortly, as I indicated earlier, we will recommend that Congress approve the construction of an MRS facility at a site on the Clinch River in Oak Ridge, limit the storage capacity in an MRS facility to 15,000 metric tons of spent fuel, preclude waste acceptance by the MRS until a construction authorization for the first repository is received from NRS; direct the Department to implement measures responsive to the concerns and recommendations of the State and local governments in Tennessee, and direct DOE to implement the program plan accompanying the proposal.

Our request supports proceeding with the activities that are critical to deployment of an MRS facility. That request for fiscal year 1987 is $46 million compared to the current $3 million in fiscal year 1986. These funds would be primarily used to collect site data and compare analyses, begin final design of the facility itself, and prepare for regulatory compliance studies and State liaison activities. The schedule for construction of the MRS allows 10 years from the time Congress approves our proceeding, to the start up of operations. The 1988 estimate is $50 million and the 1989 estimate is about $53 million.

Now, let me turn quickly to the waste fund and our revenues. Revenues collected from the ongoing fee by the end of 1985 totaled approximately $880 million. Revenues collected from the one-time fee payments for spent fuel generated prior to April 7, when the ongoing fee became effective, total more than $1.4 billion. This represents more than half of the one-time fee liability of $2.3 billion. Following receipt of these moneys, DOE last year reimbursed the U.S. Treasury approximately $265 million, which was the total amount owed on the appropriated debt transferred to the nuclear waste fund upon enactment of the NWPA.

In April 1985, the President accepted DOE's recommendation to dispose of defense waste in a commercial repository. The Federal Government, therefore, will pay an equivalent fee to that paid by utilities. This use of the repository will generate additional revenue for the fund. The amount of the additional revenue is presently being determined and, therefore, is not included in our revenue estimates. We are in the final stages of discussion with DOE's Office of Defense Programs to determine an equitable cost-sharing methodology.

In table 3 on page 29 of my detailed statement are the revenue projections for the fund itself.

Our budget request for activities associated with transportation and systems integration is $33.4 million, up from $21.3 million. The outyear estimates are about $33 in 1988 and $31 in 1989. The major activities include funding for the private sector to design, fabricate, and test prototype casks for truck, rail, and barge transport based on competitive procurements. Work will be continued to support institutional programs, environmental and economic analysis and technology development, data systems and testing and engineering development, and systems integration.

The approval by Congress of MRS would allow us to accelerate these activities by about 5 years because it would allow us to begin making site-specific transportation plans.

In program management, the 1987 budget request is $69.5 million up from $53.8 in 1986. The 1988 is $72.7 and the 1989 estimate is $72.2. The 1987 request provides technical support for waste management activities including technical support for integration, development of standard materials characterization methods by the Material Characterization Center, supporting studies including fund management activities.

This funding level provides for a sustained staffing level from 1986 to 1987 of 292 full-time equivalent positions at headquarters and in the Operations Offices for our several activities. The 1988 and 1989 estimates of $72 million approximately will provide for continued program management and similar activities.

The major emphasis will continue on developing integrated cost-effective waste disposal systems providing full protection of public health safety in the environment.

Briefly, for the civilian radioactive waste R&D program, development and demonstration activities are funded from the general fund, rather than funds collected from the utilities and deposited into the nuclear waste fund.

The 1987 request for such activities is $6.5 million compared to $16 million in 1986. These efforts are to utilize all means directly or available through the act or other authority to encourage and expedite the availability of license new at-reactor storage technologies.

In this approach no funds are requested for research and development concerning alternative means and technologies for the permanent disposal of high-level radioactive wastes, including subseabed disposal.

Activities to implement section 222 are not proposed because of the need to set stringent priorities on the use of appropriations from the general fund.

Our activities for spent fuel storage R&D is intended to encourage and expedite the most efficient use of the existing storage facilities and the addition of new licensed capacity in a timely fashion. The 1987 request to support these activities is $6.3 million compared to $8.5 million in 1986. These activities will include continued dry storage cask testing as a part of cooperative agreement with the Virginia Power; completion of preliminary tests and analyses on a transportable cask as part of a cooperative agreement with Carolina Power & Light; and initiation of rod consolidation demonstrations of spent fuel as a part of a cooperative agrement with Northeast Utilities Services. In addition, we plan to continue cooperative activities in information exchange regarding spent fuel storage and disposal with nonnuclear weapon states internationally and to continue to participate in international activities with the International Atomic Energy Agency, the Nuclear Energy Agency, and the Federal Republic of Germany.

The budget request for program direction for civilian R&D is $200,000 and supports three full-time equivalents to manage the programs.

Mr. Chairman, in summary the 1987 budget request for spending authority under the waste fund and for appropriations under the civilian R&D budget are designed to carry out an integrated waste management program in an efficient and effective manner and to achieve the 1998 mandate of the Nuclear Waste Policy Act, that is, to have in place a comprehensive and functional waste disposal system to begin receiving spent fuel.

I appreciate the opportunity to provide this summary and am ready for your questions, Mr. Chairman, at your pleasure.

The CHAIRMAN. Thank you very much.

Now that Congress has passed this new Gramm-Rudman-Hollings legislation, where will you be hurt the most, what aspects of your Department?

Mr. VAUGHAN. Mr. Chairman, with respect to the programs under the Office of Nuclear Energy which I have discussed this morning, we believe that the impact of the reductions in fiscal year 1986, which are in the neighborhood of 4 percent, represent changes that we can accept without any major impacts on our programs. We have spread that reduction pretty uniformly over all the programs, and it makes us tighten our belt a little bit, but no major programs will be canceled or significantly deferred.

Obviously, the fiscal year 1987 budget has been prepared with the objective of achieving the deficit reduction goals consistent with that act. One of the net results of that, of course, has been the balance that I mentioned in my opening statement just before you arrived, Mr. Chairman, with the fact that we are providing some more emphasis to our advanced reactor research and development efforts for space and defense energy needs and some stretchout of our program for advanced civilian reactor R&D beyond light-water reactors. We, however, believe that is consistent with the timetable for deployment of these advanced reactors.

The remedial action programs and the uranium enrichment programs will not be dramatically affected.

The CHAIRMAN. You are looking at major RIF's in 1987, fiscal 1987?

Mr. VAUGHAN. We have not, at this time, calculated the effect of impacts on contractors. We do not anticipate any major RIF's of Federal employees.

The CHAIRMAN. Mr. Rusche, from the standpoint of the waste office that you head, what is the most important impacts of the budgetary cuts that you will be required to make through 1986 and 1987?

Mr. RUSCHE. Mr. Chairman, the impacts in 1986 and 1987 are not significant and this program is one of high priority and, of course, the fact that we have an independent source of income, not the general fund, that is from fees from utilities, I think affects the assignment of priorities within the administration.

If uniform adjustments were made to the program, they would have significant impacts in future years. The program, as I even indicated today, is an increasing program, at least over the next 2 or 3 years, which is counter to the direction that we need to go in the overall budget to achieve the deficit reductions. But for 1986 and 1987 the impacts are insignificant.

The CHAIRMAN. We are still pretty much on track to meet our goals on the repository in the 1990's?

Mr. RUSCHE. We believe that to be so, although I think that by the end of this year when the Congress will have acted on MRS and we know what some of these budgetary adjustments are, we will probably have to reassess that and see. As of the moment, as I indicated, we still believe we are on track for 1998.

The Chairman. Good. Well, we are watching you. You have one of the most important assignments in the field here.

Mr. Rusche. Thank you, Mr. Chairman.

Mr. Vaughan. I would add, Mr. Chairman, with regard to private sector involvement in the AVLIS technology, that's an implicit part of our budget, if that were to be unsuccessful, some of the stringencies of reduced research and development of funding would stretch that program out further than we would like to.

The Chairman. This may be our only opportunity for the time to talk about overall policy on oversight functions with regard to the Department of Energy and I know that there are a lot of questions we won't get to today. I have some, and without objection, we will have the record open for 10 days so that members can submit their questions to supplement the information, the very solid information you have given us here in your prepared material.

Mr. Vaughan. We would be pleased to respond to those requests.

[Editor's note.—In a letter dated February 18, 1986, Chairman Udall subsequently transmitted to the DOE additional questions to be answered in writing. Those questions and DOE's responses may be found in appendix II. See table of contents for page number.]

Mr. Gejdenson. Mr. Vaughan, on the area of light water reactor R&D, you zeroed out two programs, the Loss of Fluid Test and the Extended Burnup, but you have created a new program, the Enhanced Reactor Safety Program, and about $11 million.

Now, is that funded by the utilities or is that funded through the taxpayer dollar?

Mr. Vaughan. First of all, that is not a new program that has been specifically created; that is relevant to our ongoing safety and severe accident technologies. The LOFT Program is zeroed as a separate line item because the testing which was done in conjunction with an international consortium has been finished. Some of the post-irradiation examination work, which is necessary to accomplish what you learn from the tests, is contained in that general line item.

The Extended Burnup Program was zeroed out at the direction of the Congress based on the fiscal year 1986 energy and water appropriations bill.

Mr. Gejdenson. What do you do with most of that $11 million? What do you want to do?

Mr. Vaughan. Most of that $11 million is spent on continuing research and development efforts aimed at severe accident assessment, at risk base licensing and safety efforts which provide a good technology base for assuring that we can approach the licensing of reactors in a much more rational basis in order to——

Mr. Gejdenson. When you say rational basis, what you mean is actually the deregulation of some areas of licensing?

Mr. Vaughan. No; I do not propose that we would deregulate the licensing of nuclear reactors. You may be aware, however, that the Department, along with others, have proposed and is currently before this session of the Congress, a Nuclear Facility Standardization Act in which there are several key objectives in order to bring the standardization and licensing of reactors to a more rational basis. Among those objectives are to assure that we can have fully proven but preapproved and precertified designs a——

Mr. GEJDENSON. Standardization?

Mr. VAUGHAN. Yes.

Mr. GEJDENSON. We just have a brief amount of time and I hate to cut you off, but I think I get a sense of where you are going.

How different is your program from the approximately $100 million program that the NRC presently has to do all the same things?

Mr. VAUGHAN. Typically, the Department of Energy's program is on generic approaches to the problems and much of the work that NRC does tends to be more specifically aimed at individual problems for individual reactors.

Mr. GEJDENSON. Could you give me a side by side of how you spend your money and take a look at how they spend their money? I mean, what we've got to do is we've got to tell some kids that get hot lunches, they're not going to get them? We're going to tell some people that their food is not going to be inspected as regularly and at least some of us here feel this $11 million may be able to—the same goals can be achieved by the NRC expenditure and if you could just give us a side by side and why that is different, we would certainly appreciate it.

Mr. VAUGHAN. I will be glad to provide some information for the record. We do work closely with the NRC and try to make our efforts complementary and not duplicative.

[EDITOR'S NOTE.—In a letter dated February 7, 1986, Mr. Gejdenson subsequently transmitted to the DOE additional questions to be answered in writing. Those questions and DOE's responses may be found in appendix II. See table of contents for page number.]

Mr. GEJDENSON. One of the things that generally troubles me about where we've gotten to is it seems is the policy of the only energy that we subsidize or provide incentives for or do research for is nuclear. I think that if we try to make that the only option for America's future, that we make a mistake just because making only one energy source your option is a mistake, putting all the subsidies in one basket is a mistake. Every other energy technology has basically been cut out in the new budget except nuclear, either its funding method or what have you seems to hang in there.

Let me just—this isn't going to solve the whole budgetary problem, my next question, and I hate to put you on the spot, but the—you have a program out there that has given away about $6 million in the last, what, 10 years, 30 years? It's what one of your fellows has called the Nobel Prize of the nuclear industry. This year Mr. Rasmussen and Mr. Rosenluth got it. Don't you think we could take—it's $100,000 apiece. Now, Mr. Rasmussen has worked with the nuclear industry for as long as I have been involved in nuclear energy. Back when I was in the State house in 1974 when the industry needed somebody to bring before the committee and give their side, they'd always bring Mr. Rasmussen and he always did a credible job; but, you can't find a better use of $100,000 or $200,000 a year than just give it to people? And I am not against giving out research grants or helping people do research, but it seems to me that we use this on a particular research project rather than just give it to people we would be a lot better off.

Mr. VAUGHAN. Well, I am sure you are referring to the Enrico Fermi awards, two of which were awarded yesterday and I am sure you are aware that the Atomic Energy Act permits and encourages, with the approval of the President, the Department, formerly the Atomic Energy Commission, to confer these awards for meritorious contributions in the development, use, and control of atomic energy. The Atomic Energy Commission and the Department have always felt that some limited number of awards like this were appropriate inspiration to young scientists and appropriate recognition much like the Nobel Prizes to which you referred.

Mr. GEJDENSON. If this was 1954 and we had an infant industry, I would say that that made a lot of sense, when the Atomic Energy Act was put into place and the nuclear industry was new and we needed to creat an economic incentive in this country to pay attention to it. But I would say today, with $4 billion nuclear powerplants all over the country, there is enough incentive to keep people's attention on nuclear energy.

And again, it might make sense to take this $100,000 if you don't have a specific project, maybe we ought to shift it to some other form of energy, because if you are looking for a force in society that is able to exert some direction, the nuclear industry does real well. It does so in the Congress, it does so in every State legislature and it holds its own in regulatory battles. So to use this money as an attraction to nuclear energy, I don't think in 1986 with the kind of budgetary problems we are facing that that is where we ought to spend the money.

Maybe you could, while you are doing the other thing, give me a review of why we ought to do this in 1986. Maybe the Congress did the right thing 20 or 30 years ago, whenever we put it in, but maybe it is time to move it someplace else to get rid of it.

Mr. VAUGHAN. I will be glad to provide you whatever information you would like.

[EDITOR'S NOTE.—The Department subsequently supplied the following information:]

ENRICO FERMI AWARDS

The Enrico Fermi Award, first granted by the US Atomic Energy Commission in 1954, is based on the statutory authority contained in Section 157b(3) of the Atomic Energy Act of 1954. It allows for the granting of awards for meritorious contributions to the development, use, and control of atomic energy.

In 1985 the Award was granted to Professor Norman Rasmussen and to Professor Marshall Rosenbluth. Professor Rasmussen's contributions were to nuclear energy in the development of probabilistic risk assessment techniques that have provided new insights and led to new developments in nuclear power plant safety. Professor Rosenbluth was recognized for his leadership in the development of modern plasma theory and his many contributions to the understanding of controlled nuclear fusion.

Over the past three decades the Fermi Award has recognized contributions over a broad array of disciplines, including the theory of fast computing machines, nuclear chemistry, nuclear physics, high energy physics, thermonuclear research, biomedical research, genetic research, nuclear medicine, and including as well contributions to national security and international cooperation.

Although a handful of recipients have made contributions to the field of nuclear fission, the Fermi Award should not be considered as the "Nobel Prize of the nuclear industry". The field of "atomic energy" has been broadly interpreted by the Department of Energy insofar as this Award is concerned, and the recipients and their contributions attest to that.

FERMI AWARD CITATIONS

ENRICO FERMI
(1954)

For contributions to basic neutron physics and the achievement of the controlled nuclear chain reaction.

JOHN von NEUMANN
(1956)

For his scientific contribution to the theory of fast computing machines and for his original contributions to their design and construction. More than anyone else he foresaw the important and necessary role they would play in the control and use of atomic energy and to the general advancement of the arts and sciences for the benefit of mankind.

ERNEST O. LAWRENCE
(1957)

For his invention and development of the cyclotron and for his many other contributions in nuclear physics and atomic energy.

EUGENE P. WIGNER
(1958)

For contributions to nuclear and theoretical physics, to nuclear reactor development, and to practical applications of atomic energy.

GLENN T. SEABORG
(1959)

For discoveries of plutonium and several additional elements and for leadership in the development of nuclear chemistry and atomic energy.

HANS A. BETHE
(1961)

For contributions to nuclear and theoretical physics, to peaceful uses of atomic energy, and to the security of the United States.

EDWARD TELLER
(1962)

For contributions to chemical and nuclear physics, for leadership in research on thermonuclear reactions, and for his efforts to strengthen national security and to insure the peace.

J. R. OPPENHEIMER
(1963)

For contributions to theoretical physics as a teacher and originator of ideas, and for leadership of the Los Alamos Laboratory and the atomic energy program during critical years.

H. G. RICKOVER
(1964)

For engineering and administrative leadership in the development of safe and reliable nuclear power and its successful application to our national security and economic needs.

OTTO HAHN
(1966)

For pioneering research in the naturally occurring radioactivities and extensive experimental studies culminating in the discovery of fission.

LISE MEITNER
(1966)

For pioneering research in the naturally occurring radioactivities and extensive experimental studies leading to the discovery of fission.

FRITZ STRASSMAN
(1966)

For contributions to nuclear chemistry and extensive experimental studies culminating in the discovery of fission.

JOHN A. WHEELER
(1968)

For his pioneering contributions to understanding nuclear fission, and to developing the technology of plutonium production reactors, and his continuing broad contributions to nuclear science.

WALTER H. ZINN
(1969)

For his pioneering work in atomic energy, including the world's first reactors and the fast breeder reactor, and for his distinguished record of leadership and contributions to the development of atomic reactors for research, production, and electric power.

MORRIS E. BRADBURY
(1970)

For his inspiring leadership and superb direction of the Los Alamos Scientific Laboratory throughout one quarter of a century, and for his great contributions to the national security and to the peacetime applications of atomic energy.

SHIELDS WARREN & STAFFORD L. WARREN
(1971)

For the imaginative, prescient, and vigorous efforts which made possible the early development of atomic energy so as to assure the protection of man and the environment, and for the establishment of a biomedical research program which has resulted in many substantial applications of ionizing radiation to diagnosis and treatment of disease and to the general welfare.

MANSON BENEDICT
(1972)

For his highly effective work in the design and construction of the first gaseous diffusion plant and for the production of U-235, for his many imaginative contributions to the development of the nuclear reactor, especially the safety of its use in electricity generation, for his exceptional service as consultant to the government and industry, and for his outstanding leadership in establishing a preeminent school of nuclear engineering.

WILLIAM L. RUSSELL
(1976)

For his outstanding contributions during a long and distinguished career to the quantitative evaluation of the genetic effects of radiation in mammals which serve as a major scientific base for national and international standards for radiation protection of human populations; for his major contributions to the principles of genetic theory; and most recently, for his vigorous efforts to evaluate in animals the mutagenic potential of chemical pollutants arising from nonnuclear energy sources.

WOLFGANG K.H. PANOFSKY
(1978)

For his very important contributions to elementary particle physics; his leading role in advancing accelerator technology; his positive influence on younger scientists; and the scientific advice he has given generously to the U.S. Government.

HAROLD M. AGNEW
(1978)

For his many and innovative contributions to nuclear physics and nuclear weaponry; for his dynamic leadership of the Los Alamos Scientific Laboratory; and for his forthright counsel to both the executive and legislative branches of government in the field of national security.

RUDOLF PEIERLS
(1980)

In recognition of his many pathbreaking discoveries in theoretical physics, including contributions to the understanding of the nucleus and the solid state; for his inspiration to several generations of students; for his pioneering contributions to early atomic energy developments in England and America; and for his efforts in working towards the responsible development and control of nuclear weapons.

ALVIN WEINBERG
(1980)

In recognition of his pioneering contributions to reactor theory, design, and systems; for untiring work to make nuclear energy serve the public good, both safely and economically; for inspiring leadership of the Oak Ridge National Laboratory; and for wise counsel to the executive and legislative branches of the Government.

W. BENNETT LEWIS
(1981)

For his dedicated support of heavy-water moderated reactors for research and power generation; for his inspiring leadership of Canadian nuclear energy developments; and for his contributions to the use and control of atomic energy through the International Atomic Energy Agency.

HERBERT L. ANDERSON
(1982)

For his pioneering collaboration with Enrico Fermi in demonstrating the emission of neutrons in fission at Columbia University; for his essential role in constructing the first chain-reacting piles; for his work on production and determination of the properties of tritium and helium -3; for his collaboration with Fermi in detecting the first hadronic resonance at the University of Chicago; and for his continuing contributions to understanding the nature of strong and weak nuclear forces.

SETH H. NEDDERMEYER
(1982)

For participating in the discovery of the positron, for his share in the discovery of the muon, the first of the subatomic particles; for his invention of the implosion technique for assembling nuclear explosives; and for his ingenuity, foresight, and perseverance in finding solutions for what at first seemed to be unsolvable engineering difficulties.

ALEXANDER HOLLAENDER
(1983)

For his unique role in the creation of the field of radiation biology; for his leadership as Director of the Biology Division of Oak Ridge National Laboratory; for his promotion of scientific exchange between the United States and many less developed countries; and for scientific discoveries that first pointed to the nucleic acids as the genetic materials and to the existence of repair mechanisms.

JOHN W. LAWRENCE
(1983)

For pioneering work and continuing leadership in nuclear medicine including the first treatment of patients with artificially produced radioactive materials, neutrons and heavy ion beams, and for his inspiring role in the development of a series of instrumentation techniques for noninvasive radioactive imaging of pathological conditions in man.

GEORGES VENDRYES
(1984)

For his outstanding contributions in research on nuclear energy, and for his direction of the Fennch program of nuclear power, which have been essential to the brilliant success of the sequence of fast breeder reactors constructed and operated in France.

ROBERT R. WILSON
(1984)

For his outstanding contributions to physics and particle accelerator designs and construction. He was the creator and principal designer of the Fermi National Laboratory and what is, at present, the highest energy accelerator in the world. His contributions have always been characterized by the greatest ingenuity and innovation and accomplished with grace and style.

Mr. **Vaughan**. I suspect you are aware, but perhaps not, that the money for these awards comes out of the Department's general science and research activities, and not from the budget which are discussing and reviewing here today.

Mr. **Gejdenson**. Yes; we just have oversight on that. It is just more reflective on my general interest in the whole energy area.

Mr. **Vaughan**. Well, the other thing I would like to note is the Department does not consider its entire emphasis should be on nuclear energy as a single new source. In response to your prior comment, there are and will continue to be cooperative programs with industry, which we do not consider subsidies, in the other energy fields, including fossil energy, solar energy, and so forth. And that the nuclear R&D programs that are under some of the budget categories that you noted are all typically in forms which are complementary to and cost shared with industry efforts.

Mr. **Gejdenson**. I would just say that in this year's budget, all those other forms of energy are getting a 50- to 90-percent cut in the programs that deal with solar and some of the fossil forms of energy.

Mr. **Vaughan**. If you look specifically at the advanced reactor R&D budget within our nuclear R&D decision unit, which is not specifically a part of our review before this committee, you will notice that there is a 62-percent cut in that program.

The **Chairman**. The gentleman's time has expired.

Mr. **Gejdenson**. Thank you, Mr. Chairman.

The **Chairman**. The gentleman from North Carolina.

Mr. **Hendon**. Thank you, Mr. Chairman.

I would like to walk through a brief overview with Mr. Rusche, so then there won't be any misunderstanding of exactly where I, as a Representative from western North Carolina, am coming from.

[Map shown.]

Mr. **Hendon**. The first site for permanent waste disposal has been authorized by the Congress. And you are going to come back to Congress you said later this year for authorization of MRS, and later for a second repository. You noted in your testimony today that you want $46 million next year to proceed with MRS and $78.7 million for further work on the second repository; is that correct up to this point?

Mr. **Rusche**. Correct.

Mr. **Hendon**. Congress intended, I am sure—I was here—in the Nuclear Waste Policy Act that there should be regional balance. We support that. Do you?

Mr. **Rusche**. I believe that regional consideration certainly should be a factor in final choices that the Congress makes, and I certainly agree with that.

Mr. **Hendon**. Well, I am deeply troubled, and the people of western North Carolina and the Southeast are deeply troubled, by the lack of regional balance exhibited by your proposals to date.

So far as I understand it, and I want to go through this with you, here is the lay of the land up to this point. You have picked three sites for final consideration for the first storage site. There are three finalists, are there not?

Mr. **Rusche**. We have tentatively identified three which we hope to make final later this year.

Mr. Hendon. OK. Those are in Washington State, correct?

Mr. Rusche. Correct.

Mr. Hendon. In Nevada and in Texas; is that correct, approximately there?

You have also proposed, as I understand it, MRS for Oak Ridge.

Mr. Rusche. We hope to have that proposal up soon.

Mr. Hendon. Right there.

Now, for your second repository, you have proposed several sites in Minnesota, several in Wisconsin, Maine, New Hampshire. Which one is New Hampshire, Mr. Chairman? [Laughter.]

The Chairman. Never heard of it.

Mr. Rusche. That is another part of the country.

Mr. Hendon. And you have proposed three sites, two sites in Virginia.

Mr. Rusche. Correct.

Mr. Hendon. Two in Virginia, two in North Carolina.

Mr. Rusche. Correct.

Mr. Hendon. How many in Georgia, two or three?

Mr. Rusche. One.

Mr. Hendon. One. Is that it?

Mr. Rusche. That should be—how many did you put in Wisconsin?

Mr. Hendon. I put in a couple. How many are there?

Mr. Rusche. I believe there is only one in Wisconsin.

Mr. Hendon. OK. And three in——

Mr. Rusche. Three in Minnesota, I believe.

Now we are getting close.

Mr. Hendon. Now tell me about regional balance, what you have done up to this point. Let's just look at what you have done.

Under the Nuclear Waste Policy Act, a State that gets MRS is exempt from permanent storage, right?

Mr. Rusche. Correct.

Mr. Hendon. The reason is because you want a balance. As it has been explained to me, if you do MRS, you have done your job, right?

Mr. Rusche. I think that was the thesis of the act.

Mr. Hendon. OK.

Now, Memphis, TN is 380 miles from MRS that goes in Oak Ridge. My district, where you have proposed to put nuclear waste under the Great Smoky Mountains, is 73 miles from Oak Ridge, TN. Do you see any inconsistency there, Mr. Rusche?

Mr. Rusche. No.

Mr. Hendon. None at all?

Mr. Rusche. No, sir.

Mr. Hendon. You don't.

Mr. Rusche. Because the first thing we have to find is a rock that will work. And it turns out that in your district, as well as in the others that you have identified, the first consideration, even before regionality, is finding a rock that seems to have the properties that will have a high potential for isolating the material.

Mr. Hendon. Sure, but Memphis, TN is 380 miles away and it is exempt; we are 73 miles away, and some of these are closer than 400 miles.

Mr. Rusche. Yes.

Mr. HENDON. You don't see any problem?

Mr. RUSCHE. Well——

Mr. HENDON. I want to tell you that the Congressman from western North Carolina and a number of Congressmen throughout the Southeast see a glaring problem. OK?

Mr. RUSCHE. Yes, I believe I heard you.

Mr. HENDON. And to address that, I have an amendment, legislation, pending, when you come back up for MRS—we believe that if Memphis is exempt that we ought to draw a circle out about as far as Memphis, about 400 miles, and just say, hey, we as a region have done our part if MRS comes 73 from me. You would support that?

Mr. RUSCHE. I would follow the will of Congress in every respect.

Mr. HENDON. So what would be your position?

Mr. RUSCHE. I think that is about as strong a position as I could take, Congressman.

Mr. HENDON. Well, we always ask for executive comment. What would be your comment? This is very important to us.

You are coming back for $46 million and $78.7 right now. You want $125 million from this committee. As a member of the committee, I want to know how you all feel about regional balance, and I want to know it now, if at all possible.

Mr. RUSCHE. I think regional balance is a secondary consideration to quality of rock. I believe we have conducted an exercise which your district has been involved with, your State has been involved with, over the last 3 years which has given us the best indication of rocks that have such potential. I think we need to look at those rocks.

We are yet 10 years from asking you to authorize a second repository. We have not identified these sites as waste sites. We have identified them as sites worthy of investigation.

Mr. HENDON. All right, let me ask you this. What shall I tell a man who called me last week and said he just lost a sale on a large piece of property right in the area? What do you want me to tell him? What would you tell him?

Mr. RUSCHE. I would tell him, I guess, that the Congress has made a choice that, for the good of the country, we have got to find a place to put nuclear waste.

Mr. HENDON. Let me share something with you. You mentioned you are going around to hold 70 hearings. I was down in Madison County, listening to the people that run this country, thank goodness, the other day, and I told a lady at a country store, I said:

> You know, these people in Washington don't understand, these bureaucrats just don't understand, and I'm going to have them down here when they come to this hearing and have them listen to you folks who pay the taxes and, thank goodness, make the decisions ultimately in this country

And she said, "Mr. Hendon, I'm not sure I'd bring them to Madison County."

Honestly, my people are angry, they are frustrated, they are scared. We don't want this under the Great Smoky Mountains. We want some regional balance, Mr. Rusche. And I am going to do all I can—I don't want there to be any misunderstanding—I am going to do everything I can as a Member of this Congress and as a member of this committee to see to it that the regional balance that this Congress foresaw and wants is achieved.

Mr. RUSCHE. Congressman, I think I would only suggest that if you believe it important that regional balance supersede quality of rock, then that is a very important consideration. It is not the consideration that I believe is embodied in the act now. And if you and the Congress reach that conclusion, as long as I am Director of this office, you can be sure that I will honor it to the letter.

Mr. HENDON. Thank you, Mr. Chairman.

The CHAIRMAN. The gentleman from Louisiana.

Mr. HUCKABY. Thank you, Mr. Chairman.

Mr. Rusche, table 1 that you submitted showing the receipts and expenditures from the nuclear waste fund, you are projected, I believe, for the first time to run a deficit in 1987 as far as the funds that are generated versus what you are spending. Of course, since we have made the decision to store nuclear military waste in the repository and, as you pointed out, the Federal Government will be picking up a piece of this tab, have you worked out how this cost is going to be allocated? I mean, are we just going to pick up the difference or are we going to do it on projected metric tons of storage?

Mr. RUSCHE. Let me try to clarify the table, if I could. There are two elements in our revenue. The first element is the ongoing revenue from the 1 mil per kilowatthour fee, and that is the comparison I believe you are making.

In addition, the act requires that utilities pay a one-time fee into the fund for fuel generated prior to passage of the act. That total obligation is about $2.3 billion, of which, as I noted in my testimony, about $1.4 billion has been paid in as a one-time fee. Today, our fund balance is about $1.5 billion. We have not gone negative. And every year we provide to you what we call, what you asked for and directed, a fee adequacy report. That report will show that the 1 mil per kilowatthour fee, combined with the one-time fee and some future contribution from the Federal revenue stream for defense wastes, will be adequate for funding the program well into the nineties.

So the impression that this table unfortunately led you to is not quite correct in the sense that we have not exceeded our income.

Mr. HUCKABY. I realize that, but you are drawing on some of the principal of what has been accumulated in the past.

Mr. RUSCHE. But it is equally applicable to the conduct of the program. So I would like to be very clear that even if that were the case, what the Congress directs us to do is to bring a request for you to increase the fee and that, for this program, all of the activity is funded by the utilities. And if we ever get to the place where it is not, we are obligated to report to you and ask for authority to have the utilities pay more.

Mr. HUCKABY. Thank you.

As an initial sponsor of the MRS legislation some 7, 8 or 9 years ago, however long it has been now, I am very pleased with the direction that the Department has taken. Would you describe to the committee somewhat the timetable of when you plan detail engineering, actual site construction, when you could begin to start receiving spent fuel rods at the MRS facility and actually how it would work?

Mr. Rusche. Our proposal, hopefully, is to be sent to the Congress in a very short time. But I think before you arrived, I indicated that the district court in Tennessee has issued an opinion which we have yet to fully evaluate. This may affect the timing of our submittal of the proposal.

Assuming the proposal arrives shortly and Congress acts on the proposal in this year, we would expect to as these funds requested would provide, immediately proceed to final design and preparation of the licensing documents and, in about 2 years, would hope to file a licensing application with the Commission, would hope to have the facility under construction by about the end of the decade and be prepared to receive spent fuel in 1996. That is about 2 years before we would expect the repository to be operating, and even them the operating repository would be receiving fuel at a reduced rate. So we would accelerate the rate at which we could receive the fuel 3,000-ton-per-year capacity by about 5 years having the MRS.

Mr. Huckaby. Now, you say you will limit the site facility to 15,000 metric tons. That is approximately, as I recall, the utilities generate about 3,000 tons per year, so that is about 5 years of storage there.

Mr. Rusche. Correct.

Mr. Huckaby. You don't intend on receiving any military waste at the MRS?

Mr. Rusche. We do not plan to store any. It might turn out there be a logistical value from transportation to move some of the military waste and just package it in a large cask. We would not plan to store any there for sure and, at the moment, do not even plan to use it for transportation of defense waste.

Mr. Huckaby. Could you describe briefly physically how you envision the facility appearing, the MRS?

Mr. Rusche. The facility literally could consist of a number of support buildings, and so forth, with a major packaging and handling facility which would be a large masonry monolith, so to speak, which would contain hot cells, handling equipment and areas for packaging, consolidating rods, and so forth. It would be a major place in which casks could be handled, unloaded, repackaged, and so forth.

The total land area would probably be about 400 acres, as we visualize now for that amount of storage. The storage of the material that is to be there for this interim period of time would be in dry casks of concrete, a right large cylinder of concrete stored outdoors on a parking lot.

Mr. Huckaby. How long would visualize these casks remaining at the MRS before they went to the permanent repository?

Mr. Rusche. Well, the cask would be reusable. The fuel that might be stored in them, I would expect not to be at the MRS on the average more than a few years; 5 years perhaps is a reasonable average to think about.

On the other hand, there might be occasions in which a few pieces, for one reason or another, might be stored somewhat longer, and on a number of occasions in which it would be much less than that.

Mr. HUCKABY. Would the, for lack of a better word, the hotness or the time of decay have any impact on how long spent fuel rods stayed at MRS?

Mr. RUSCHE. Yes, it would. For example, if you had an occasion in which you had some need to discharge early or not store for the normal period in the pools of the individual reactors, one might elect to store the fuel at the MRS for a more extended period. The normal course would, however, be one in which we would expect, but at least the first 10 or 15 years, all the fuel that would pass through would have been in fuel pools in reactors for perhaps 10 years or more and, therefore, would have largely decayed.

Mr. HUCKABY. What is the estimated cost of the MRS as far as the construction?

Mr. RUSCHE. About $700 million or $800 million is our current estimate. With the total life cycle cost, that includes operation, close-down, decommissioning, and so forth, for its total life of perhaps 50 or 60 years is about $2.7 billion, of which about $700 million is compensated for by adjustments in the system otherwise.

Mr. HUCKABY. Could you briefly elucidate the local task force committee recommendations, how they feel about it?

Mr. RUSCHE. The task force composed of citizens in the Oak Ridge area of Roane County and Anderson County, I think, did a very unusual and very professional job, and their conclusions were several. I don't have them right before me. Then let me try to recall quickly. One, they concluded that the facility could be, designed, operated, and built safely; that it could serve the purposes that we suggested that it could. The facility concluded that it was important that there be developed a rather novel set of arrangements or interactions between the Department and the community to assure them that it was being done adequately and appropriately. And among these, and our response to them in the proposal, you will find a proposal to establish a steering committee of which they would have members who would function in the operation, oversight, and management.

They thought that it was important that there be compensation. And we will propose as a part of this $46 million, if you would authorize this, we would begin payments to the community about equivalent to those payments as if the facility were a $1 billion facility and taxed. When the facility goes into operation, we would go from payments to actual grants and equal to taxes in effect.

It was a very mature job. They looked at transportation very extensively. They looked at socioeconomic effects, local community economic growth, and they came to some slightly different conclusions than those the Governor has represented.

Mr. HUCKABY. Thank you.

The CHAIRMAN. I don't want to conclude this hearing without offering some comfort to my friend from North Carolina, who is doing what I am sure I would do if the situation was reversed, speaking out in the interests of the people of his own district who contacted him on this.

But if we closed down all nuclear powerplants tomorrow morning and dumped all nuclear weapons in the ocean the next day, we would still have a terrible waste problem. This stuff has collected for 44 years now or longer, and it has got to go somewhere. And I assure my friends from North Carolina and everywhere else that it will be in one of the 50 States. I don't think we will send it to Haiti or to the Soviet Union or to the Philippines or anyplace else. It has got to be put in one of the States.

I think Mr. Rusche and the Department are carrying out the mandate of the Congress. They didn't make this policy, and the policy was not a regional policy.

Actually, all we know at this point is that there will be one installation, this first tier, as decided upon. The policy of Congress is to build it, to do it as soon as we can. And that will either be in Texas or Nevada or Washington. It will be thousands of miles from North Carolina.

Second, we may or may not have a second-level repository, a second deep-storage repository. That will take further action by the Congress in the 1990's, and that may be at one of the sites we talked about here this morning. It may not be. I would think the chances of it being in North Carolina are pretty slim.

The third possibility is MRS, a related kind of installation which requires a separate congressional authorization. That will never be built unless Congress authorizes it, and I suspect Congress probably will. So that could go there. The site for that has not been decided on.

So regional considerations, as Mr. Rusche accurately stated, are important. I wouldn't want to dump everything involving nuclear waste in one State or two States or one region, if I could help it. I think we are probably going to end up, my best guess is—and that is all it is—we will end up with one of these repositories in the West and an MRS facility somewhere in the East.

But the important thing is, where is the right kind of rock? Where in all the 50 States do we have the formations that will enable us to keep this junk for another 10,000 or longer years and isolated from the air and the water of the country? I think it can be done.

But it has got to go somewhere. I think you can give me—I can pull the name of any one of the 50 States out of a hat and in 3 minutes I can give you 7 good reasons why it should not go in that State. In the last round there was great alarm in Utah and great alarm in Mississippi. Our colleague from Mississippi, Trent Lott, had a little old amendment when we were on the floor which said that you can't put this repository in any place where the county population has a density of more than such and such. It turned out that that fit his county, his respective site, and no place else. Well, I had to speak against that amendment.

I then went out to Utah where a lot of my old friends and relatives were agitated. There was a site out in the canyon lands country which is barren and desolate, and you can't find people if you look for them. They said, "What the hell's going on here? You can't put this out there in this barren country. There aren't any people here. We've got to keep it that way!" [Laughter.]

The CHAIRMAN. "It would ruin the canyon lands if we had people coming in here. They would no longer be isolated."

So you can't put it where the people are and you can't put it where they are not. [Laughter.]

The CHAIRMAN. So we will go along logically and in an orderly way. And I think the folks in North Carolina really ought to relax, because the chances of one of these facilities getting there or within that proximity are not really great at this point, in my judgment.

Mr. HENDON. Thank you, Mr. Chairman.

The CHAIRMAN. Any further questions?

If not, I think we will conclude.

Mr. Seiberling couldn't be here and asked me to ask you a question. Let me get this for the record. Last year, Mr. Seiberling said:

> The DOE decided to abandon all construction work in the gas centrifuge enrichment project, GCEP, in Portsmouth, OH. The new uranium enrichment criteria propose that the taxpayers pay all the costs of this $3 billion investment and none of these costs will be charged to the uranium enrichment customers. GAO has questions of legality of this proposal to write off a $3 billion investment. How does DOE justify this writeoff?

Mr. VAUGHAN. Mr. Chairman, there are several parts to that answer, some of which I covered in my statement.

The existing uranium enrichment criteria, as well as those which have been proposed within the section dealing with cost recovery, provide that the cost to be recovered and the rates to be charged include appropriate uranium enrichment assets. Those facilities which are operating and usable for the purpose of providing uranium enrichment services, the portion of the gaseous diffusion plants which are used for commercial services, are included.

The gas centrifuge enrichment plant has been financed, by and large, from annual payments by the customers. It is not now and never will be usable for providing enrichment services. Good accounting practices consistent, we feel, with the law and with the existing criteria, and those criteria that we have proposed, merit not including that as an asset to be included in the enrichment services charge.

I would note that this matter is covered in the notice of proposed rulemaking that has been published in the Federal Register, and that all parties have an opportunity to comment on the pros and cons of that matter, and all comments will be considered.

The CHAIRMAN. Thank you.

I think that concludes our hearing this morning, and I appreciate it very much. Thank you, gentlemen.

[Whereupon, at 11:30 a.m., the subcommittee was adjourned.]

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APPENDIX I

TUESDAY, MARCH 5, 1985

ADDITIONAL MATERIAL SUBMITTED FOR THE HEARING RECORD

STATEMENT OF
JOHN S. HERRINGTON
SECRETARY OF ENERGY
BEFORE THE
SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
U.S. HOUSE OF REPRESENTATIVES

MARCH 5, 1985

Mr. Chairman and Members of the Subcommittee, I appreciate this opportunity to appear before you and to give you an overview of our current energy situation and the FY 1986 budget for the Department of Energy (DOE). I will highlight the activities of the civilian high-level radioactive waste management program under the Nuclear Waste Policy Act, the Department's uranium enrichment enterprise, and the low-level radioactive waste and remedial action programs. I will also discuss the future role of DOE funding for State low-level waste activities and the execution of the Secretary's responsibilities with regard to the state of the domestic uranium industry. Your invitation to this hearing enclosed a list of specific questions and asked that they be addressed for the record. We have prepared responses, and I would like to provide them to you today.

CURRENT ENERGY SITUATION

I am pleased to report that the energy situation facing the Nation today is an encouraging one. One aspect of our improved energy situation is the dramatic reduction over the past few years in petroleum imports. Net petroleum imports have declined from 46 percent of total U.S. oil consumption in 1977, the peak year for imports, to 29 percent in 1984. President Reagan's complete decontrol of the domestic oil market was a major factor in reducing U.S. dependence on foreign oil. Decontrol encouraged domestic oil production, conservation, and production of alternative fuels.

In addition, the probability of a severe oil supply disruption is much lower today than it was in the 1970's. Two major developments in the world oil market caused this reduced vulnerability. First, worldwide dependence on oil from the Persian Gulf has declined precipitously. In 1978, Persian Gulf producers accounted for 44 percent of non-communist world production. Today they account for only 28 percent. Second, there is an excess of worldwide oil production capacity of 10 million barrels per day, which, together with our Strategic Petroleum Reserve stocks, serves to reduce the likelihood of an intentional supply disruption. Clearly, we are much less vulnerable today to a supply disruption than we were when the Department of Energy was established.

We have also made significant gains in conserving our energy resources. Despite strong economic growth in 1984, it is estimated that total energy consumption in that year was close to that of 1973 and was far below what pre-1973 trends would have produced had those trends continued. Yet economic output over the same period of time has continued to expand.

Although the news is good, we must not succumb to complacency. The international economy is heavily interdependent, and most of our trading partners are far more vulnerable to supply disruptions than we are. A major crisis in international energy markets would be felt here. The prudent policy for the Department of Energy to follow is to take full advantage of the absence of a supply "crisis" to develop a mix of energy supply and end-use technologies that can contribute to a secure energy future.

BUDGET OVERVIEW

The FY 1986 budget for the Department of Energy was developed with two objectives in mind -- to continue progress toward the goal established in the Fourth National Energy Policy Plan of achieving an adequate supply of energy at reasonable costs, and to contribute to Government-wide efforts to reduce the deficit by limiting Federal expenditures. This budget succeeds in meeting both objectives. It continues the program strategy of seeking a balanced and mixed energy resource base by supporting promising avenues of research in a wide variety of technology areas, while making a substantial contribution to deficit reduction. To ensure maximum economic efficiency, the Department is seeking improved international collaboration in major energy research and development programs.

The FY 1986 budget is almost $12.5 billion, approximately $1.9 billion less than in FY 1985, and more than $3.0 billion below what our budget would have been had we continued the FY 1985 level of services without change. Anticipated outlays in FY 1986 are $12.0 billion, and proprietary receipts collected by the Department are estimated at $2.8 billion.

Most of the reduction from the FY 1985 appropriated level results from the decision to impose a moratorium on further development and filling of the Strategic Petroleum Reserve. The remainder of the reduction is the net result of a number of program budget decisions plus the application of cost-saving management reforms and a 5 percent pay reduction for Federal employees.

In presenting the Department's budget, we have divided it into categories of activities that have common characteristics.

Research and Development programs constitute the largest portion of the budget -- $5.1 billion, or 41 percent of the total. This grouping combines civilian and defense programs that share research and development as a common thread. In formulating our budget for Research and Development programs, we concentrated resources on activities which are not only essential to our strategy of developing a mix of energy technologies but also appropriate to the Federal Government.

Defense Production and Support accounts for $4.8 billion, or 38 percent of the total budget. This program category includes production of nuclear weapons and special nuclear materials in support of Department of Defense requirements, plus supporting programs.

Waste Activities includes all programs involved with civilian and defense nuclear waste management, including research and development on waste handling and disposal technologies, an integrated high-level radioactive waste disposal system, and remedial actions at contaminated Department of Energy and non-Government facilities. We are requesting $1.6 billion for these activities in FY 1986, an increase of $295 million, which is primarily in the Nuclear Waste Fund financed by nuclear waste disposal fees collected from utilities for nuclear-generated electricity.

In addition to the revenue-financed Nuclear Waste Fund program just mentioned, a number of the Department's activities resemble businesses, in that they generate revenues or, as in the case of the Strategic Petroleum Reserve, maintain an inventory of crude oil that could be sold to refiners in the event of a major supply disruption. In this category of business enterprises we include the Strategic Petroleum Reserve (SPR), the Naval Petroleum and Oil Shale Reserves, the Power Marketing Administrations, and the Uranium Enrichment enterprise. The budget request for these business enterprises is $554 million. The revenues from these activities, which either offset the budget requests (as in the case of uranium enrichment) or are deposited in the Treasury, are expected to total approximately $4.1 billion.

The last major category in our budget request is Departmental Management, which includes overhead for headquarters and field activities and is relatively unchanged from FY 1985.

I would like now to discuss selected major programs of interest to this Committee.

ACTIVITIES UNDER THE NUCLEAR WASTE POLICY ACT

Nuclear Waste Fund Program

The Nuclear Waste Policy Act of 1982 mandates a comprehensive set of Federal activities, directed by DOE, that are designed to begin the operation of a Federal waste management and disposal system capable of accepting spent nuclear fuel and high-level radioactive waste from commercial nuclear power reactors by 1998. The FY 1986 budget represents the second budget formulated for these programs since passage of the Act. This budget presents an integrated picture of programmatic activities for a total waste management system.

The Act established the method of disposal, a schedule for carrying out activities leading to disposal, technical milestones and processes, institutional processes, and a funding mechanism to ensure successful implementation of a comprehensive, functional waste management system. To finance activities related to the development, construction and operation of a waste disposal system, the Act established the Nuclear Waste Fund. The main source of revenue for this fund is fee payments from nuclear utilities for nuclear-generated electricity. Utilities have been paying into this fund since April 7, 1983, and revenues collected through February 1, 1985, for spent fuel generated since April 7, 1983, total approximately $553.6 million.

In addition, high-level radioactive waste and spent fuel generated before April 7, 1983, are subject to a one-time fee that is equivalent to the ongoing fee of 1 mill per kilowatt hour. Revenues from the one-time fee will approximate $2.3 billion. Utilities have three options for payment of the one-time fee, and they must choose one by June 1985. Some utilities have already indicated that they may choose the option whereby payment will be made by June 1985. Payments under this option could total approximately $770 million. Near-term revenue projections are as follows:

Revenue Source	Revenue Projections ($ in Millions)
Nuclear Generation Fees (1 mill/kWh)	
FY 1983 (actual)	$ 73.6
FY 1984 (actual)	329.5
FY 1985	350.3
FY 1986	401.1
One-Time Fees	
FY 1985 (tentative)	$ 770.0

The Nuclear Waste Fund and the revenues paid into it create the necessity, as well as the opportunity, for fiduciary responsibility to conduct the program like a business. Generic research and development activities are not funded under the Nuclear Waste Fund. Research and cooperative agreements on spent fuel and research on alternative disposal concepts are funded under the Department's Energy Supply Research and Development appropriation.

The FY 1986 budget request for budget authority funded by the Nuclear Waste Fund is $571.5 million, divided among program elements as follows:

Program Element	FY 1985 ($ in Millions)	FY 1986 ($ in Millions)
Repository Deployment	$ 269.1	$ 480.7
Monitored Retrievable Storage	8.5	12.9
Transportation and Systems Integration	2.4	22.6
Program Management and Technical Support	44.4	55.2
Debt Service (Interest)	3.3	--
Total	$ 327.7	$ 571.4

The goal of the programs under the Nuclear Waste Fund program is to provide for permanent isolation of commercial high-level radioactive wastes and spent fuel by placing them in a geologic repository. To meet this goal, DOE is relying on development of a functional waste management system which includes deployment of one or more permanent repositories and possibly intermediary facilities, as well as a transportation system.

Major accomplishments have been made since the enactment of the Nuclear Waste Policy Act. In February 1983, DOE formally identified nine potentially acceptable sites in six States for the first repository: two in Utah, one in Washington, one in Nevada, two in Texas, two in Mississippi, and one in Louisiana. DOE notified the Governors of those States, the State legislatures, and the tribal councils of any Indian tribes that would be affected.

On December 6, 1984, after extensive State and public review and comment, and after concurrence by the Nuclear Regulatory Commission, DOE issued General Guidelines for the Recommendation of Sites for the Nuclear Waste Repositories.

On December 20, 1984, the second anniversary of the passage of the Nuclear Waste Policy Act, DOE issued Draft Environmental Assessments proposing five sites for nomination as suitable for site characterization for the first repository. A period of

90 days was allowed for public review and comment. The five sites, in alphabetical order by State, are as follows:

- Mississippi -- Richton Dome
- Nevada -- Yucca Mountain
- Texas -- Deaf Smith
- Utah -- Davis Canyon
- Washington -- Hanford.

In addition, the Draft Environmental Assessments proposed that three of the sites -- Yucca Mountain, Deaf Smith, and Hanford -- be recommended to the President for site characterization.

After consideration of oral and written comments and consultation with the affected States and Indian tribes, DOE will formally nominate at least five sites as suitable for site characterization and will recommend three of the nominated sites to the President for site characterization as candidates for the location of the first repository. It is expected that the recommendation will be made in late summer 1985. Site characterization will be carried out only at the sites approved by the President.

As part of the Department's efforts toward siting a second repository as specified in the Act, studies of crystalline rock formations are being conducted in three regions of the United States -- North Central, Northeastern, and Southeastern -- to identify potentially acceptable sites. No field studies have been conducted by DOE in these areas. It is anticipated that in FY 1986 areas will be identified for field investigation.

In a second major program area, the need for and feasibility of Monitored Retrievable Storage (MRS) facilities are being considered as part of an integrated waste system that includes repositories, MRS, and the necessary transportation system. A proposal for the construction of an MRS facility is now being prepared for submittal to Congress as required by the Act. The FY 1986 budget request assumes that Congress will authorize DOE to proceed with activities that are critical to the deployment of an MRS facility capable of meeting waste system needs and providing assurance of the Federal Government's ability to accept spent fuel and high-level waste beginning in 1998.

The third major program area in the funding request for FY 1986 provides for the support required to develop adequate transportation as part of the integrated waste system for the shipping and management of nuclear waste among the various components of the national radioactive waste disposal system.

Civilian Radioactive Waste Research and Development

DOE activities in the areas of spent fuel storage research and development, alternative (subseabed) disposal concepts, and generic research, development, and demonstration related to nuclear waste repositories are budgeted under the Energy Supply Research and Development appropriation rather than through funds collected from utilities and deposited in the Nuclear Waste Fund. The FY 1986 budget request for Civilian Radioactive Waste Research and Development activities is $23.4 million, divided among various program areas as follows:

Program Element	FY 1985 ($ in Millions)	FY 1986 ($ in Millions)
Spent Fuel Storage Development	$ 12.6	$ 8.9
Alternative Disposal Concepts	11.5	12.5
Generic Methods and Supporting Studies	2.0	1.7
Program Direction	0.3	0.3
Total	$ 26.4	$ 23.4

The Civilian Radioactive Waste Research and Development program comprises a series of cooperative agreement activities designed to advance the research objectives outlined in the Nuclear Waste Policy Act. Some of these research and development programs were in progress before the Act was passed, and others are new initiatives. All of the activities have now been integrated, to avoid duplication and to complement the total waste management system.

DOE is also conducting and participating in several international research and development programs that include investigations of alternative methods and technologies for permanent disposal of radioactive wastes. Subseabed disposal is the only alternative disposal concept currently being studied in detail. Other generic studies are being conducted to assure adequate international cooperation, including technical assistance to non-nuclear weapon states and an independent assessment of the Department's waste disposal program, and to evaluate potential alternatives that could improve the cost, scheduling, or technical aspects of the program.

NUCLEAR ENERGY ACTIVITIES

Civilian Reactor Development Activities

The Department's Nuclear Energy civilian reactor development programs have been restructured to meet the near-, intermediate-, and long-term energy needs of the Nation. One important element of this effort will be to facilitate removal of institutional and regulatory barriers to renewed investment in nuclear powerplants by the private sector. The Department will be submitting a comprehensive nuclear licensing and regulatory reform package this year.

The Department continues to apply its unique experience and technical resources to the efforts at the Three Mile Island (TMI) site. In return, the experience that we have gained and the technology developed will be of generic benefit to the Government and to the entire nuclear industry. Removal of loose fuel debris is scheduled to begin at TMI in July of this year. Major DOE activities in FY 1986 will include examination of portions of the damaged reactor core at a DOE laboratory and development activities associated with removal of the several tons of fuel known to be in the bottom of the reactor vessel and in the reactor coolant system. This research and development work will contribute directly to the objectives that I have noted above.

In parallel with the technical efforts, the Edison Electric Institute has implemented a plan by which the Nation's utilities will provide General Public Utilities Nuclear Corporation $150 million toward the cost of the cleanup.

Our Civilian Reactor Development programs are concentrated on developing base technology for all classes of reactors, including innovative designs for high-temperature gas-cooled reactors, liquid-metal-cooled reactors, a new generation of light-water-cooled reactors for possible deployment in the 1990's, and advanced breeder reactors for use beyond the year 2000. A key objective of these research and development programs is to develop technology for advanced reactors with improved economic performance, simplified designs, and passive safety features that will permit faster licensing and construction.

Two key elements in assuring the health of the nuclear energy option are the ability to maintain a competitive domestic uranium enrichment capability and a demonstrated ability and willingness to handle radioactive wastes in a technically sound and safe manner.

Uranium Enrichment

The Department's funding request for the Uranium Enrichment program in FY 1986 is approximately $1.6 billion in budget authority, which is fully offset by $1.6 billion in projected revenue. The funds requested are distributed among the major elements of the program as follows:

Program Element	FY 1986 ($ in Millions)
Uranium Enrichment Activities	
Power	$ 884.0
Enrichment Research and Development	150.0
Gas Centrifuge Enrichment Plant	340.0
All Other	238.7
Total Expenditures	1,612.7
Uranium Enrichment Revenues	-1,612.7
Net Appropriation	$ 0

The FY 1986 Congressional budget for Uranium Enrichment has been prepared in advance of a number of key program decisions, which are targeted for this spring. While the budget details may require some revisions after the technology selection, production, and business strategy decisions have been made, we believe that the key program objectives can be satisfied within a net zero appropriation for FY 1986. We expect to present additional detail on our budget request in mid-1985.

In January 1984, we announced our new business strategy and released the Utility Services (US) contract to our customers. Response to the US contract has been positive, and we appreciate the good-faith efforts of all our customers in negotiating conversions to the US contract. Slightly more than 90 percent of DOE's previous sales base converted to the US contract. The results of the contract conversion strongly support DOE efforts to improve the financial condition of the enrichment enterprise. We plan to continue these efforts. By further reducing costs, we can continue to pass price savings on to our customers while fully recovering costs.

We continued enrichment operations at our three gaseous diffusion plants (GDPs) in 1984 and made significant progress in enhancing the overall economy of their operation. By shifting production to the source of cheapest power, we were able to reduce the average cost of the energy used to produce each separative work unit (SWU) by more than 10 percent during FY 1984. Through some very dedicated work on the part of Martin Marietta, Goodyear, and the Department, we have been able to identify alternative operating modes for the GDPs that have further enhanced their operating efficiency.

By using off-peak power at the GDPs, we predict that further significant savings can be achieved. Off-peak power was utilized in the GDP at Portsmouth, Ohio, through much of 1984 and will be utilized at the GDPs in Paducah, Kentucky, and Oak Ridge, Tennessee, in 1985. All of these efforts were undertaken to assure that operating costs will be reduced, that near-term prices will decline as rapidly as possible, and that the GDPs will be operated in the most cost-effective manner possible during the remainder of their useful life.

During 1984, an intensive technical and economic evaluation of the Advanced Gas Centrifuge (AGC) and the Atomic Vapor Laser Isotope Separation (AVLIS) technologies was initiated. A Process Evaluation Board (PEB), chaired by Peter Johnson of the Bonneville Power Administration, was named by then Secretary Hodel in June 1984. Since June, exhaustive reviews of basic technology, estimated plant costs and schedules, and other related factors have been evaluated by the PEB. In May 1985, DOE will select the most promising technology for further development, including life cycle and reliability testing. It is important to note that additional development work on the technology selected will be necessary to confirm process performance and economics and to determine an optimum deployment schedule. This further development is inherent in moving the technology selection date from 1987 to 1985; we must ensure technical adequacy before committing to a deployment.

Both the AGC and AVLIS technologies have indicated technical and economic soundness and the potential for assuring that the United States will maintain a position of international competitiveness in the long term. Also, since the new technology that will be selected must better the production costs of the gaseous diffusion process, the technology competition has provided added impetus to efforts to further reduce GDP costs. This has stimulated significant improvements in GDP economics that will aid our near-term competitiveness and contribute to the development of sound advanced technology concepts for future use.

Construction of the Gas Centrifuge Enrichment Plant (GCEP) project, utilizing Set III machines, was continued in 1984, although at a slower pace. Procurement of Set III machines from the three manufacturers is continuing. The project slowdown was effected to assure that our investment prior to a final technology selection will be minimized, and that the GCEP design can be thoroughly evaluated in the context of the Set V technology. The reevaluation of the GCEP design was necessary to assure that if the AGC concept wins the technology selection in May 1985, it can be incorporated into the enterprise in an economically optimum manner. A significant project accomplishment in 1984 was the completion of the installation of the first cascade of Set III centrifuges in March. Today, significant progress is being made toward the beginning of experimental operation of the plant in April 1985.

We intensified our efforts to improve marketing and customer service in 1984. We are committed to serving our customers better, communicating with them more effectively, and conducting the enterprise in a competitive manner on a continuing basis. As any good business would do, we are still listening to and learning from our customers' thoughts on how we might serve them better, and we have a strong commitment to continue reliable, responsive service to all of our customers. Also, we have made significant progress in the development of a strategic plan that will define the course that the uranium enrichment enterprise should take in the long term to assure that we will make the most effective use of our resources and will remain competitive.

Although the contract conversion process was very successful, we find that a substantial amount of customer requirements during the late 1980's and early 1990's remains uncommitted to any supplier. Specifically, we estimate that approximately 8 million SWUs are uncommitted in the 1987-90 time frame. The Department currently is developing means under the US contract by which we will be able to compete for those sales. Better utilization of our existing GDP capacity could lower average production costs and increase our sales volume.

In summation, 1984 was a year in which we continued the process of better matching the uranium enrichment enterprise to the market, bringing our costs and prices down, and serving our customers better. It was a good first step, but it was only a beginning. It is our intention that the price of enriched uranium continue to decline in the future. We will do this through effective management of the existing elements of the enterprise and by introducing advanced technology when it is economically advantageous.

In May 1985, the final elements of our business plan will be well defined. Even though the budget cycle is ahead of our schedule for finalizing our business plan, we have developed a budget for FY 1986 which we believe encompasses all reasonable program options. Additional details on the budget will be submitted in mid-1985 and will reflect the impact of advanced technology selection and related production decisions. Also, the May 1985 business strategy will include a plan for repayment of the Government's investment in the uranium enrichment enterprise. At present, it is estimated that the uranium enrichment program will begin to make payments to the U.S. Treasury in FY 1986. The specific amount of the payments will be determined when additional budget details are finalized in mid-1985.

We believe that we have a well-structured process in place for making the crucial technical and business decisions that face the enterprise. We ask for your support in seeing this process through to completion, and we expect to be discussing its results with you in a few months. Implementation of our business strategy will be a multiple-year undertaking, but we have set the course and are prepared year-by-year to make the tough business decisions that will be required to achieve our competitive goals. We thank you for your cooperation, support and interest in this program.

Status of Uranium Mining and Milling Industry

In regard to the current state of the uranium mining and milling industry, I am aware of the significant contraction of the domestic industry from its peak years. In my confirmation hearings on January 31, 1985, I promised to provide within 60 days of taking office a specific report on my impressions to that point of DOE's possible action with regard to the uranium industry. We are in the process of completing that report within our projected schedule.

Nuclear Waste Technology and Remedial Actions

Our Nuclear Waste Technology funding request for FY 1986 is $11.7 million in budget authority, as compared to the $13.0 million appropriated in FY 1985. The FY 1986 budget

request for the Remedial Action program is $233.0 million, an increase of $73.0 million over the FY 1985 appropriation. FY 1984 and 1985 activities in a number of these projects have been characterized by overall program planning, engineering preparation, and establishing cooperative agreements with the States, Indian tribes, municipalities, and industrial concerns involved at the various sites. In addition, work has been initiated at the highest priority sites. To maintain the schedule for this work, the higher funding levels requested or planned in the next 2 years are needed as we move from the planning and engineering stages to the actual performance of work at additional sites.

Because of the Department's strong commitment to completing these cleanup efforts, we have elected in balancing our budget priorities to continue these programs at levels only slightly below previous outyear funding projections rather than maintaining them at FY 1985 funding levels. To have chosen the latter course would have entailed unnecessary delays in completing many of the projects, with resulting increases in the total costs to the Government over the period of work.

The funds requested for Nuclear Waste Technology are distributed among the program elements as follows:

Program Element	FY 1985	FY 1986
	($ in Millions)	
Low-Level Waste	$ 6.2	$ 4.8
Waste Treatment	6.3	6.4
Program Direction	0.5	0.5
Total	$13.0	$11.7

The role of DOE's Nuclear Waste Technology program is to assist the States and regions in developing a reliable national system for managing commercial low-level wastes and to develop technologies that will safely and effectively treat and immobilize nuclear fuel cycle wastes -- low level, high level, and transuranic. Our Low-Level Waste program continues to provide technical assistance to the States, and it has been useful in getting proposed regional compacts presented to the Congress for consent. In this regard, we responded in February to Chairman Udall's request for recommendations on the criteria that should be used to evaluate proposed regional compacts.

In the Waste Treatment program, we conduct the research and development necessary to reliably solidify high-level and transuranic wastes for transportation, storage, or disposal. Our major FY 1986 effort in waste treatment will be to complete the last phase of development of the process for incorporating high-level waste into a borosilicate glass form acceptable for disposal. In November 1984, the Department entered into a collaborative research and development project agreement with the Federal Republic of Germany on process controls and operation of a facility for solidification of high-level radioactive waste. As part of this exchange, the radioactive liquid-fed ceramic melter at the Pacific Northwest Laboratory will be operated over a period of several months in FY 1985 and FY 1986. At least 10 and as many as 30 canisters of radioactive borosilicate glass will be produced and subsequently used by the Federal Republic of Germany for testing purposes in their waste management program.

The funds requested for the Remedial Action program are distributed among the program elements as follows:

Program Element	FY 1985 ($ in Millions)	FY 1986 ($ in Millions)
Formerly Utilized Sites	$ 18.0	$ 17.7
Grand Junction	1.5	0.9
Uranium Mill Tailings	62.0	110.0
Surplus Facilities	29.5	39.0
West Valley Demonstration Project	47.9	64.0
Program Direction	1.1	1.4
Total	$160.0	$233.0

Our program for remedial action at certain contaminated facilities and sites is divided into five major activities, two of which are being conducted pursuant to the Department's responsibilities under the Atomic Energy Act as amended, and three in accordance with separate public laws. Our FY 1986 budget request includes a narrative description of the work accomplished to date and anticipated in FY 1986. The scope of these programs and planned FY 1986 activities is as follows:

(1) The Formerly Utilized Sites Remedial Action Project (FUSRAP) covers non-Government former nuclear processing sites that require stabilization or removal of contaminated material. DOE currently has authority to conduct remedial action at 25 sites. In FY 1986, remedial action will focus on continuation of ongoing efforts at the highest priority sites, located near Niagara Falls, New York; Wayne, New Jersey; Middlesex, New Jersey; Maywood, New Jersey; Colonie, New York; and Hazelwood, Missouri.

(2) A second project covers our participation in a Federal/State cooperative effort, mandated in Public Law 92-314 as amended, to remove uranium mill tailings used for construction purposes in Grand Junction, Colorado. By the end of FY 1986, we will have completed remedial actions at 576 of the estimated 604 structures requiring attention. Completion of the remainder is planned for FY 1987.

(3) The Uranium Mill Tailings Remedial Action Project (UMTRAP) is directed toward the cleanup of 24 inactive uranium mill tailings disposal sites and several thousand associated vicinity properties, as specified in Public Law 95-604. In FY 1986, remedial action will be underway at 7 processing

sites, and over 400 vicinity properties will be cleaned up. By the end of the year, we will have completed work on the first 3 of the 24 UMTRAP sites. Our planned pace is to complete work at all the UMTRAP sites by 1990, consistent with the schedule mandated by Congress.

(4) The Surplus Facilities Management Program (SFMP) provides for the safe management and disposition of contaminated DOE civilian program facilities (currently grouped into about 34 projects) that are no longer in use. The major project under this program is the decontamination and decommissioning of the Shippingport Atomic Power Station, which will demonstrate the safe and economical cleanup of a commercial power reactor. In FY 1986, the Shippingport project will continue at a pace consistent with completion about 1-1/2 years later than originally planned, as a result of making choices of priorities within our Departmental budget constraints.

(5) Another major waste management activity for which we have responsibility is the demonstration of high-level waste solidification at the Western New York Nuclear Center near West Valley, as specified in Public Law 96-368. In FY 1986, the West Valley program will focus on verification testing of the vitrification system in the Component Test Stand and on the construction and startup of the supernate treatment

system. Efforts will continue on engineering and procurement of waste solidification support systems and decontamination and decommissioning of the facility. Solidification of the wastes is scheduled to begin in 1988, with completion scheduled for 1990.

This concludes my prepared statement. The areas I have discussed represent a continuum of efforts necessary for maintaining the nuclear power option for the generation of electricity as part of our national energy policy objectives. I would be pleased to answer any questions which the Committee may have.

PRE-HEARING QUESTIONS AND ANSWERS
RELATING TO THE
MARCH 5, 1985 HEARING
BEFORE THE
HOUSE COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT
WITNESS: JOHN S. HERRINGTON
SECRETARY OF ENERGY

URANIUM ENRICHMENT

Question 1: a. Why didn't the Department of Energy submit its Utility Services contract to the Congress for review?

Answer: Prior to release, the Department determined that the issuance of the Utility Services (US) contract was within the Department's existing statutory authority including Section 161v of the Atomic Energy Act. The Department considered its actions proper and necessary to prevent further erosion of the U.S. position in the world enrichment market.

Consistent with DOE practice to keep the Congress and enrichment customers fully informed on significant matters, the Department did provide timely notice of its intentions to affected customers and the appropriate segments of the Congress. The need for a revised uranium enrichment contract was discussed with Congress during an October, 1983 hearing before the Subcommittee on Energy Conservation and Power. A copy of the draft contract, a fact sheet outlining its major features and objectives, and a copy of the letter transmitting the contract to industry for comment were sent to cognizant authorization and appropriations committees by DOE on December 30, 1983. Briefings, informal discussions, and telephone communications were conducted with congressional members, committees, and staff that requested additional information. The final contract form was sent to customers on January 18, 1984. On the same date, the contract, a descriptive fact sheet, and a copy of

URANIUM ENRICHMENT

1.a.cont'd the letter transmitting the final contract to the customers were sent to all cognizant committees.

1. cont'd b. Please include an explanation of why the Department views its contract as being consistent with Section 161(v) of the Atomic Energy Act.

Answer: The Department considers the manner of adoption was consistent with the provisions of Section 161(v) of the Atomic Energy Act, as well as the Department's prior practices in developing and executing uranium enrichment contracts. Section 161(v) of the Atomic Energy Act of 1954, as amended, provides that "the Commission shall establish criteria in writing setting forth the terms and conditions under which services provided under this subsection shall be made available," and that before the Commission establishes such criteria "the proposed criteria shall be submitted to the Joint Committee, and a period of 45 days shall elapse while Congress is in session...unless the Joint Committee by resolution in writing waives the conditions of all or any portion of such 45-day period."

The Department considers that contract provisions are within the existing criteria. The legislative history of Section 161(v) indicates that the Uranium Enrichment Services Criteria, among other things, are to include the general features of standard contracts for uranium enrichment services but Section 161(v) was not intended to require formal review by the Joint Committee of all the terms and conditions of the contracts themselves.

URANIUM ENRICHMENT

1. cont'd	c. What preparations are being made in the event that the contract is struck down by the court in the Western Nuclear suit?
Answer:	The Department considers it took lawful and proper actions in the issuance of the Utility Services contract and, accordingly, has a high level of confidence that its position will prevail in the District Court. We expect that the lawsuit will be vigorously defended, including appropriate appellate review in the event of an adverse decision in the District Court.

URANIUM ENRICHMENT

Question 2:	The August Tri-Committee Business Advisory Panel on Uranium Enrichment recommended that DOE seek the participation of experienced business personnel in key programmatic decisions, and that it pursue the privatization of the enrichment enterprise. a. Please describe any current or anticipated activities related to these recommendations.
Answer:	During the past year, we have made a concerted effort to operate the uranium enrichment enterprise on a more businesslike basis. We have met with members of the Tri-Committee Business Advisory Panel on three occasions. We have sought and obtained the advice of business and financial advisors in Process Evaluation Board matters, marketing activities, and business and financial planning for the uranium enrichment enterprise as a whole. The Department is studying private sector investment in the uranium enrichment enterprise. The May 1985 strategy will identify the advantages that private participation could bring to the optimal deployment of advanced enrichment technology.

URANIUM ENRICHMENT

2. cont'd b. What other initiatives has DOE taken to ensure the execution of proper business decisions in the formation of enrichment services strategies?

Answer: We have carefully selected the decision criteria for making key uranium enrichment decisions and have sought assistance from private sector advisors. We have sought and received advice and assistance in business planning from each of the major industrial participants in the program. Also DOE has taken steps to improve management structure through various means including establishment of a Management Board to review and make recommendations to DOE management on major program issues. The board is comprised of senior DOE officials from Headquarters and the field. Finally, the Department has reviewed its approach to business planning and decision-making with the Tri-Committee Advisory Group.

URANIUM ENRICHMENT

Question 3:	a. Describe the role of the Process Evaluation Board (PEB) with regard to the May 1985 technology selection between AGC and AVLIS.
Answer:	The role of the Process Evaluation Board (PEB) is to analyze and evaluate the two advanced uranium enrichment technologies. The Board will evaluate each technology and provide the Secretary of Energy with a report of its findings as to which technology should be selected for continued research, development, and demonstration and possible deployment. The evaluation will include detailed assessments of the technical performance, cost, and schedule and identification of the business and market factors that may impact the future deployment of each of the technologies.

URANIUM ENRICHMENT

3. cont'd b. Will the selection be based solely on factors described in DOE's "Criteria and Methodology for the Assessment of the AGC and AVLIS Technologies?"

Answer: The Process Evaluation Board will apply the factors described in "Criteria and Methodology for the Assessment of the AGC and AVLIS for Technologies" in its evaluations.

URANIUM ENRICHMENT

3. cont'd c. How were PEB members selected?

Answer: The membership of the PEB was established by the Secretary based on recommendations from the Assistant Secretary for Nuclear Energy. The intent was that the membership should be drawn from persons within the Department of Energy who have knowledge and expertise in all areas of the selection criteria. Thus, individuals with backgrounds in business, enrichment operations, management of large R&D programs, and construction of large facilities are members of the PEB. Technical, scientific, management, and business talents are incorporated in the Board.

URANIUM ENRICHMENT

3. cont'd	d. What schedule will the PEB use to make its selection?
Answer:	The schedule for the PEB activities established on July 23, 1984 has been adhered to. This schedule calls for the PEB to make its report to the Secretary in May 1985. The evaluation process is on scheduled and it is expected that this date will be achieved.

URANIUM ENRICHMENT

Question 4: a. What is the basis for the Department's decision to delay the 1987 advanced technology deployment date to 1989?

Answer: First, for clarification, 1987 had not been officially established as the target deployment date, and neither has 1989. The technology selection decision in May 1985 will select one technology for further development and demonstration. A decision on deployment will be made at a later date.

As part of its review, the Process Evaluation Board requested that deployment plans be developed to assist in the evaluation of the Advanced Gas Centrifuge and Atomic Vapor Laser Isotope Separation technologies. The plans presented were based on prompt deployment scenarios. Both were subsequently revised because they were not consistent with revenue, price, financial risk, and other constraints.

URANIUM ENRICHMENT

4. cont'd b. How will this affect DOE's effort to compete with foreign producers?

Answer: A key factor of the deployment plans will be enhancing the capability to compete with foreign producers. The deployment plan will be based on technical and economic soundness. As such, they would complement our efforts to become more competitive in the marketplace.

URANIUM ENRICHMENT

Question 5: Please provide n overview of DOE and contractor enrichment staffing at DOE enrichment facilities.

Answer: The following table summarizes the current Government and contractor employment levels for uranium enrichment.

Contractor		Employees
Gaseous Diffusion Plants		
Martin Marietta	Oak Ridge, Tennessee	1,400
Martin Marietta	Paducah, Kentucky	1,300
Goodyear Atomic	Portsmouth, Ohio	1,900
Gas Centrifuge Enrichment Plant (Under Construction)		
15 Contractors	Various Locations (Primarily Ohio, Tennessee, and California)	5,300
Technology R&D		
o AVLIS Development		
University of California	Lawrence Livermore (CA)	155
Martin Marietta	Oak Ridge, Tennessee	145
o Centrifuge Development		
Marietta, Boeing & Others	Oak Ridge, Tennessee	740
Garrett	Torrance, California	200
Goodyear	Akron, Ohio	60
Total Contractor		11,200
Federal Employment		338
	TOTAL	11,538

URANIUM ENRICHMENT

Question 6: a. Exactly what is the status of DOE negotiations with TVA to reduce capacity charges at the Oak Ridge and Paducah Gaseous Diffusion Plants?

Answer: Extensive discussions between DOE and TVA have been unsuccessful in relieving DOE of demand (capacity) charges for contract power not used at the gaseous diffusion plants. The major impediment has been the inability to structure a solution that, in the opinion of TVA, would not adversely impact its ratepayers. Discussions are continuing with TVA in an attempt to identify future areas for further cost reductions.

URANIUM ENRICHMENT

6. cont'd b. Is there a possibility that reductions in such charges could prove continued operation of gaseous diffusion plants a more desirable option than development of advanced technologies?

Answer: No, the steady state operating cost of Gaseous Diffusion Plants is $70 per SWU and the projected production costs for advanced technologies are $25-40 per SWU.

URANIUM ENRICHMENT

6. cont'd c. DOE's budget proposal notes that DOE is considering the possibility of closing down one of its Gaseous Diffusion Plants (GDP), if market demand and other factors make it a desirable move. What specific conditions would need to exist for DOE to make such a decision?

Answer: On the demand side, today the three plants are operating at less than 40 percent of their combined capacity. Projected demand includes commercial customers under contract and Defense requirements. Less certain demand includes some portion of current customers' uncommitted requirements and possible weapons requirements. Two GDP's are capable of meeting this cumulative demand through the year 2000.

On the cost side, shutdown of a GDP would appear to result in cost savings compared to a three plant operation. However, new innovative operating schemes which offer significant economies are being tested that may be more attractive at low power levels. However, as production levels increase in the 1990's, near-term economies tend to be overtaken by lower plant efficiencies.

URANIUM ENRICHMENT

Question 7: Please explain the reasons for the projected $800 million shortfall in program revenues for FY 1986-1988 and any actions under consideration, including alternate advanced technology deployment scenarios, to deal with this shortfall.

Answer: The revenues in the next few years resulting from conversions to the US contract are lower than projected one year ago. The lower estimates reflect customer workoff of inventories, intensifying price pressure from our competitors and revised estimates of nuclear growth both in the US and abroad. Current estimates were provided to both technology teams for their use in preparing reference deployment plans. The initial prompt deployment plans submitted for both technologies exceeded preliminary estimates of outyear revenues by amounts similar to those you cited. These were rejected and revised plans were developed. The Department is currently evaluating various means of increasing sales in the future through innovative marketing and by reducing costs through deployment of advanced technology and more efficient operation.

The proposed AGC deployment plan would defer the transition to large-scale advanced machine (Set V) production from 1986 until 1988, if AGC is selected in May 1985. Recommended completion of the full 13.2 million SWU production plant would be delayed from 1994 to 1996. If AVLIS were selected, the revised deployment plan could begin construction of a production plant in 1990.

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7. cont'd We believe that both proposed deployment plans are consistent with program objectives since they allow new technologies to be introduced in the 1990's while allowing adequate time for thorough demonstration before major capital investments are made.

URANIUM ENRICHMENT

Question 8:	DOE's budget request notes plans for DOE to begin making repayments of debt incurred for facility construction costs. What effect would this have on DOE's projected SWU price and its ability to comply with the full cost recovery requirements of the Atomic Energy Act?
Answer:	We believe that the enrichment program can be made financially sound enough to generate positive cash flows in the future, and that payments can be made to the Treasury while continuing to reduce prices to customers in order to retain market share. A key aspect of the repayment schedule will be the ability to assure the long-term health of the enterprise. Because some of past net appropriations were used to support production for Government requirements, we are currently determining what portion of the outstanding débt should be recovered from commercial customers. Payments to the Treasury would not affect DOE's compliance with the full cost recovery requirements of the Atomic Energy Act. The impact on the SWU price would depend on the amount and schedule of payments.

URANIUM MINING AND MILLING INDUSTRY

Question 1: Please provide us with the most up-to-date information available on the status of the domestic uranium industry.

Answer: The most up-to-date published DOE information available is Report DOE/S-0033 dated December 1984 which has been provided to this Committee under separate cover.

Uranium Mining and Milling Industry

Question 2: How does DOE define "viable" with regard to the condition of the uranium industry?

Answer: Under Section 170b of the Atomic Energy Act as amended (42 U.S.C. 2210(b)), Congress required the Department of Energy to issue, by rule, criteria to assess the viability of the industry and specified eight criteria that the Secretary must weigh and consider in reaching his conclusion. The statutory criteria require an evaluation of the following items: reserves, production capacity, employment and price levels, capital investment and exploration plans of the uranium industry, import levels, and inventories and requirements of domestic utilities. Accordingly, the final rule applies these factors in specifying how the Department will examine the viability of the industry and make the determination required by the statute.

URANIUM MINING AND MILLING INDUSTRY

Question 3: We are aware of at least two mill closings within the past two months. Does this indicate a substantive change in the condition of the domestic industry, in comparison to its status at the time DOE's viability determination was made?

Answer: I am aware of the significant contraction of the domestic uranium mining and milling industry from its peak years in response to the deferral and cancellation of nuclear powerplants.

The Department's December 1984 report, "The Domestic Uranium Mining and Milling Industry: 1983 Viability Report," anticipated the uranium market would worsen through 1985 before getting better. While it does not appear that the closure of the two mills indicates a substantive change in the domestic uranium mining and milling industry's outlook as compared to its projected status at the time DOE's viability determination was made, it is nonetheless a cause of great concern. We shall continue to monitor closely developments in the industry. The determination of viability for 1984 will be made when the assessment is completed later this year.

HIGH-LEVEL NUCLEAR WASTE REPOSITORY DEVELOPMENT

QUESTION 1: (a) Describe the criteria and ranking system used to nominate high-level waste sites for characterization. (b) What is the relative similarity or difference among sites with respect to the assessment criteria? (c) What is the relative weight placed on technical and environmental (postclosure and preclosure) criteria? (d) What would be the impact on the nomination decision if technical criteria were substantially increased in weight relative to environmental criteria? (e) How were relative weights placed on environmental considerations, for example, repository or site characterization impacts on the national park near the Davis Canyon site, versus those on the large-scale seed farm and other farming properties on or near the Deaf Smith site in Texas?

ANSWER 1(a): The criteria and ranking system for choosing five sites from the nine sites identified as being potentially acceptable, and for choosing three sites to recommend for characterization follow directly from the Department's General Guidelines for the Recommendation of Sites for the Nuclear Waste Repositories (10 CFR 960).

In considering sites for nomination, each of the nine sites was evaluated on the basis of the 17 disqualifying conditions specified in the guidelines. No site was disqualified on application of this test. Next the sites were grouped into distinct settings reflecting similar geologic and hydrologic characteristics. Five such distinct "geohydrologic settings" (including two settings with only 1 site each) were identified. For settings containing more than one site (i.e., Gulf Coastal Plain, Permian Basin, and Paradox Basin), a preferred site was selected on the basis of a comparative evaluation of the potentially acceptable sites in that setting. This evaluation considered the characterisitics that differentiated among the sites within the setting. Postclosure criteria were given more weight than preclosure criteria in selecting preferred sites.

Answer 1(b): Because sites in the same geohydrologic setting are generally in close proximity and have similar geologic and hydrologic properties, discrimination is difficult. The discriminating characteristics displayed by the sites were different for the different settings. For the Gulf Coastal Plain, the major discriminators among the three salt dome sites were dome size and the extent of dissolution. For the Permian Basin, the only discriminators between the two bedded salt sites were population density and distribution, and transportation. For the Paradox Basin, the single discriminator related to the presence of federally-protected areas within the controlled area of one of the sites (Lavender Canyon).

On completion of the steps described above, five sites in five geohydrologic settings remained, and are proposed for nomination: Davis Canyon, Utah; Deaf Smith County, Texas; Hanford site, Washington; Richton Dome, Mississippi; and Yucca Mountain, Nevada. These sites were then compared against the qualifying conditions of the postclosure and preclosure siting guidelines. Rank orderings of sites were established considering, on balance, the favorable and potentially adverse conditions associated with the guidelines. The rank orderings were then aggregated using three simple techniques and according to the relative weights specified in the siting guidelines.

The results show that the Davis Canyon, Deaf Smith, Hanford, and Yucca Mountain sites are most favorable and are virtually indistinguishable with respect to the total set of nine postclosure guidelines; the Richton site appears to be slightly less favorable. With regard to the eleven preclosure guidelines, the Hanford and Yucca Mountain sites are clearly the most favorable. The Deaf Smith site appears slightly more favorable than the Richton site, and considerably more favorable than the Davis Canyon site with regard to the preclosure guidelines.

Answer 1(c&d): Therefore, on balance, the Deaf Smith, Hanford, and Yucca Mountain sites, as a set, appear more favorable than the Richton and Davis Canyon sites. This conclusion is the same over a broad range of relative weightings of the postclosure versus the preclosure guidelines. Specifically, this conclusion holds from a postclosure: preclosure weighting in the proportion of 51:49 (expressed as percentage) up to a proportion of about 85:15, which represents in DOE's view, the maximum weight that can be reasonably assigned to the postclosure guidelines.

Answer 1(e): With regard to the weights assigned to the preclosure guidelines, the Department's siting guidelines specify that the groups that represent radiological safety; environment, socioeconomics, and transportation; and ease and cost of repository development be given decreasing weights. Within any group, specific guidelines were given equal weight. Thus, the guideline on environmental quality was given the same weight as the guideline on socioeconomics, which covers such considerations as impacts on the farming business in Texas.

QUESTION 2:	What is the status of consultation and cooperation (C&C) agreements being negotiated between the Department and potential repository host states? What technical and economic relationship is being requested by states, and what such relationship is contemplated by the Department?
ANSWER 2:	The only potential host State with which we have begun negotiations on a C&C agreement is the State of Washington, and those negotiations are presently in abeyance. Two key issues have stalled negotiations. One is the issue of liability. The State of Washington wants the DOE to assume unlimited liability without regard to fault. DOE has proposed to include provisions in the agreement which would provide to DOE contractors operating a repository and to the State the protection of "persons indemnified" under the Price-Anderson Act of 1957 (Section 170 d. of Atomic Energy Act of 1954, as amended). Further, DOE has stated the liability of the United States for its own acts, as distinguished from indemnity for acts of persons indemnified under Price-Anderson, is circumscribed by the Federal Tort Claims Act. Any indemnity extended by the Department other than pursuant to Price-Anderson would have to be expressly limited to the availability of DOE appropriations.

The second issue is defense waste. The State of Washington wants effective input into the Federal decision process concerning existing defense waste at Hanford and wants Hanford defense waste included in the agreement. DOE's position is that the State should be given (and has been given) opportunity for input into the Federal decision process concerning integration of civilian and defense waste, but we should not include existing Hanford defense waste in the C&C agreement. We have discussed the possibility of negotiating C&C agreements with other states, but none has yet indicated an interest in pursuing negotiations at this time.

Negotiations on a C&C agreement are also underway with the Yakima Indian Nation (YIN), but the YIN have asked for a postponement of further negotiations pending completion of negotiations between DOE and the State of Washington.

Technical and economic relationships with the State of Washington are also defined in the draft C&C agreement provisions tentatively agreed to by both parties. Under Section 117(c) of the Act, the Department and affected parties are to agree on a series of procedures for technical and economic cooperation. In the draft C&C agreement with the State of Washington, procedures have been drafted to cover such areas as foreign waste, on-site and off-site studies and investigations, DOE response to site objections and concerns, access to information, impact assistance, public involvement, utilization of available expertise, state permits, transportation and emergency response. Financial assistance provisions have also been worked out pursuant to Section 116(c) of the Act. A draft provision on procedures for conflict resolution has also been tentatively agreed to by DOE and the State of Washington. The Department assumes that other States will want similar provisions covering economic and technical relationships in their C&C agreements.

QUESTION 3: The General Accounting Office, the National Academy of Sciences, National Research Council and the United States Geological Survey have commented on the importance of peer review to the Department's repository development program. Recently, the GAO concluded that the Department's standard peer review procedures are inconsistent from site to site and did not include a component for comprehensive review by non-DOE entities. Please provide recommendations for improving the consistency and objectivity of technical peer review of the repository development program.

Answer 3: The Department is keenly aware of the need for high-quality, independent peer review during each step of the process to select, construct, operate, and close a geologic repository. Accordingly, in response to the GAO comments concerning consistent peer review practices, we are developing procedures for verification of technical work in our systems engineering and quality assurance plans. Each site project will use these procedures for specifying their process of peer review. Differences in technical emphasis will exist among the projects due to inherent site differences, but the quality and completeness of the review processes should be consistent. As a rule, impartial experts in various fields will provide reviews of relevant technical studies. The experts may come from industry, academia, national laboratories, and other Federal agencies; in each instance they will be free of affiliation with DOE's repository development program.

Besides peer review by technical experts, the Department also solicits reviews of program activities by independent agencies such as the Nuclear Regulatory Commission, U.S. Geological Survey, and the appropriate State agencies. These reviews provide external, non-DOE input to the Department's repository activities well beyond that required by the Nuclear Waste Policy Act.

QUESTION 4: What State or local permits are required to be obtained before site characterization can begin at nominated sites? What is the status of obtaining these permits? What is the projected schedule for obtaining these permits?

ANSWER 4: DOE has identified the State and local permits applicable to each potentially acceptable site. These permits deal with such areas as: land use, terrestrial and aquatic ecosystems, air quality, aesthetic conditions, noise, and archaeological, cultural, and historical resources. An analysis of the projected ability to comply with the requirements of State and local environmental protection regulations is presented in Chapter 6 of the draft EAs under the Environmental Quality guideline evaluation. DOE is currently developing a schedule for permit acquisition, and intends to begin collecting the site data needed for these permit requirements following recommendation of three sites for characterization to the President. DOE will consult with affected State and local governments to determine the specific data-gathering requirements for State and local permitting processes and to the extent to which the Department can comply with those requirements.

QUESTION 5: Describe any litigation currently affecting the repository program under the Nuclear Waste Policy Act, its potential for delay of the program, and how the program could be altered by adverse judicial decisions.

ANSWER 5: Four separate suits were recently filed against the Department's repository program under the Nuclear Waste Policy Act. The first was filed by the State of Nevada concerning the denial of a portion of their grant request. Two suits, consolidated for court review, were filed by the State of Texas and a number of individuals and groups challenging the Department's identification and notification of potentially acceptable sites in Texas. Another suit was filed by a number of public interest groups requesting the court to review the Department's siting guidelines that were issued on December 6, 1984. In addition, two lawsuits regarding the appropriate level of payments to be made into the Nuclear Waste Fund have been filed against DOE. In each instance, DOE's position has been upheld at the Federal District Court level and appeals have been taken by plaintiffs in both cases. Although the potential for delay exists in the event of an adverse decision, the Department does not believe at this time that any of these suits will result in a substantial delay, or a need for any significant alteration in the program.

QUESTION 6: A draft report regarding disposal of defense nuclear waste at a repository developed under the NWPA was issued in July of 1984, and a final report was due January 7, 1985. What is the status of the draft recommendation that defense waste be disposed of in the NWPA repositories? When will a final decision be made by the President, as required by the Act?

ANSWER 6: The draft report prepared by the Department entitled An Evaluation of Commercial Repository Capacity for the Disposal of High-Level Waste was made available for public review and comment in July 1984. The Department received comments from about 30 individuals and organizations. The report was revised in response to the comments and sent by former Secretary Hodel to the President on February 6, 1985.

Congress will be promptly advised upon completion of the Presidential review.

After addressing the factors specified in the Act--cost efficiency, health and safety, regulation, transportation, public acceptability, and national security--the report that the Department prepared concluded that developing a repository for disposing of defense waste only is not required.

QUESTION 7: What is the current estimate of the cost of characterizing a single potential repository site? How does this compare to estimates for this work made by the Department in 1982? On 1979?

ANSWER 7: To provide the most responsive answer, we have estimated the average cost of all the activities, with one exception, being conducted by each of the three first repository projects during the site characterization phase. The one activity we have not included is the repository Title I design. This design activity would not be required for site characterization. Activities that are part of the cost estimate include, for example, waste package design and development, conceptual repository design, development of performance assessment models, institutional relations, and grants, as well as construction of exploratory shafts and conduct of in-situ testing. Also, the current estimate reflects the cost of a five-year site characterization phase during which two exploratory shafts are constructed at each site. The 1982 estimate also reflects the cost of a five-year site characterization phase but only includes one exploratory shaft at each site. The 1979 estimate reflects the cost of a three-year site characterization phase with no exploratory shaft construction.

With the above clarifications, the estimates are as follows:

Current estimate: Average cost of five-year site characterization phase with two exploratory shafts -- $730 million in 1986 dollars.

1982 estimate: Average cost of five-year site characterization phase with one exploratory shaft -- $470 million in 1983 dollars (equivalent to approximately $540 million in 1986 dollars).

1979 estimate: Average cost of three-year site characterization phase with no exploratory shafts -- $205 million in 1979 dollars (equivalent to approximately $265 million in 1986 dollars).

WASTE MANAGEMENT SYSTEMS

QUESTION 1: A draft report produced for the Department, "The Integrated System for the Management of Radioactive Waste," states that it "describes the DOE's integrated waste-management system." What is the status of report? Does it accurately reflect the waste disposal system contemplated to be developed by the Department?

ANSWER 1: The referenced paper was prepared to describe DOE's concept of the integrated waste system as currently envisioned. Such a system considers all of the functions needed to package, handle, transport, temporarily store and permanently dispose of spent fuel and high level waste. Key components of the integrated system are the Monitored Retrievable Storage Facility, the repository and the transportation system. The MRS would receive spent fuel from the utilities, consolidate and package the fuel for shipment to the repository. Temporary storage would be provided at the MRS as necessary to meet systems requirements. The construction of the MRS has not been authorized by Congress; however, DOE plans to request such authorization. Operations at the repository would concentrate on permanent emplacement of the packages received from the MRS. A safe, efficient transportation system will be designed using the private sector to the extent practical. Dedicated trains will be utilized from the MRS to the repository. Enclosed for your information is a copy of the final referenced paper.

February 14, 1985

THE INTEGRATED SYSTEM FOR THE MANAGEMENT OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE

1. INTRODUCTION AND SUMMARY

The Nuclear Waste Policy Act of 1982, Public Law 97-425 (NWPA), established a program for the management of radioactive waste and assigned to the U.S. Department of Energy (DOE) the responsibility for implementing the program. This paper describes the DOE's concept of an integrated waste management system leading to the permanent disposal of radioactive wastes in a geologic repository.

The system will be capable of accepting and handling commercial spent nuclear fuel (SNF), commercial high-level waste, high-level waste produced as a result of national defense activities, and any other waste forms declared by the U.S. Nuclear Regulatory Commission (NRC) to require permanent isolation. It will be sufficiently flexible to accept all expected forms of waste without imposing requirements on the generators of the waste that would interfere with the orderly operation of their facilities and on-site storage prior to Federal acceptance of title to the waste.

For convenience and brevity, the terms "radioactive waste" and "waste" are used in this paper to mean spent fuel from commercial nuclear power reactors and the high-level waste that results from the reprocessing of spent fuel and from atomic energy defense activities.

The integrated system described in this paper is the current system design being evaluated by the Office of Civilian Radioactive Waste Management (OCRWM). Its primary feature, as compared to previous system concepts, is the inclusion of an integrated Monitored Retrievable Storage (MRS) facility that would package and temporarily store spent nuclear fuel from commercial power reactors.

In order to have a totally integrated waste management system, activities that are conducted by the utilities and other waste generators, prior to transfer of the waste to the Federal Government, must be considered. These prior activities will influence what equipment the Federal Government will need to provide in order to transport the waste from the site at which it is generated and what packaging or repackaging operations may be necessary at Federal facilities. Therefore, the waste management system is defined to include the waste generators. A distinction is made in this paper between the portion of the integrated system for which the waste generators are responsible and those for which the Federal Government is responsible. This paper focuses primarily on the Federal portion of the integrated waste management system and how it would be structured and operated.

This paper includes concepts about the MRS, and the attendant system of which it is a part, for which firm decisions have not been made. Further studies are underway to fully assess the merit of these concepts.

1.1 Functions and Requirements

The purpose of the Federal portion of the integrated waste management system, as embodied in the Act, is to dispose of commercially generated spent fuel and high-level radioactive waste, and high-level waste from defense-related activities, in a manner that protects the health and safety of the public and maintains the quality of the environment. The fundamental purpose of the NWPA is to provide a system that has the long-term effect of minimizing the risk to current and future generations. To do so, the system must be able to perform the following functions:

- Accept commercially produced spent nuclear fuel and high-level waste, as well as defense high-level waste.

- Transport spent fuel and high level radioactive waste from reactors and other sources to disposal sites, including intermediate facilities designed for storage and packaging, as required.

- Prepare, package, and store the waste as needed before permanent disposal.
- Provide permanent disposal for all waste accepted into the system.

1.2 System Configuration

The principal components of the proposed integrated waste management system are the waste generators (primarily reactors), the monitored retrievable storage (MRS) facilities, the geologic repositories, and the transportation system that links these components with each other. Packaging and handling operations associated with each of these components must also be integrated to ensure efficient operation of the entire system.

Spent fuel stored at commercial reactors, that will be accepted by the system for ultimate geologic disposal, may be either various types of intact fuel assemblies or canisters of consolidated spent fuel rods. Most of that spent fuel will be shipped directly from reactor sites to the MRS facility. Spent fuel from reactors located close to a repository, but an appreciable distance from the MRS facility, may be shipped directly to the repository. Solidified high-level waste could be shipped directly to the repository from the sites at which it is generated or to the MRS where it may be combined with other waste for shipment to the repository. Shipments will be made by rail, truck, or barge, using specially designed, shielded transportation casks that comply with applicable safety regulations.

The MRS facility will consolidate and package spent fuel from commercial reactors before shipment to the geologic repository for permanent disposal. In addition, the MRS facility will provide temporary storage for all waste received by DOE and awaiting shipment to the repository. The length of time for which spent fuel will be stored at the MRS facility will depend upon repository operating factors, such as start of operations, waste acceptance rates, and thermal design limits. Shipments from the MRS facility to the repository may be made in dedicated trains or barges to minimize the number of shipments.

The flow of waste from the waste generators to an MRS facility and a repository is illustrated in Figure 1. The MRS will have a finite lifetime. After all waste has been emplaced in the repository, the MRS will be placed in caretaker status, capable of receiving waste from the repository, in the unlikely event that retrievability of waste is necessary. The MRS facility will then be decommissioned and removed from the site. The functions and characteristics of each of the components of the integrated waste management system are described more fully in Section 2 of this paper.

1.3 Implementation Schedule

Acceptance of waste is planned to begin with the initiation of MRS facility operations as early as 1996. The system will be designed to receive spent fuel at or near the projected rate of commercial spent-fuel generation by 1998. The first geologic repository is planned to begin phased operation by no later than January 31, 1998. The second repository would commence operations eight years later. The schedule for the proposed integrated waste management system is shown in Figure 2. Approximate times required for developing, siting, licensing, constructing, and operating the various facilities of the system are depicted.

2. DESCRIPTION OF THE PROPOSED INTEGRATED WASTE DISPOSAL SYSTEM

The principal components of the integrated waste management system are described more thoroughly in this section. The discussion begins with a description of activities related to the storage of spent fuel at the reactor facilities, and to the packaging of that fuel for subsequent shipment to a Federal facility. These activities are and will remain the responsibilities of utilities, and they constitute the primary interface between the Federal portion of the system and the waste generators. The discussion then progresses to a review of principal Federal facilities of the system and concludes with a commentary about the structure and operations of the proposed transportation system. Figure 3 depicts the functions of each of the principal elements of the integrated system.

2.1 Waste Generators

2.1.1 Generators of Spent Nuclear Fuel

Nuclear power utilities will continue to store spent fuel at their commercial nuclear reactor sites until the Federal waste management system is available to accept the fuel. The spent fuel stored at various reactors will differ in its physical, thermal, and radiation characteristics because of differences in fuel assembly designs, the storage techniques used by each utility, fuel cycle operating procedures, and the duration of at-reactor storage.

It is expected that most of the spent fuel that is accepted into the integrated Federal system will come directly from reactor storage pools. However, because of the possibility of limited storage-pool capacity at some reactors, some utilities may pursue the option of storing spent fuel outside of their pools in licensed dry storage casks until that fuel is transferred to the Federal Government. The DOE is cooperating with utilities in licensed demonstrations, and it is anticipated that licensed casks would be available to industry within the next few years. The utilities are also investigating rod consolidation procedures, which represent another method to significantly increase the capacity of some storage pools. Either way, the spent fuel will be in the form of intact fuel assemblies or canisters of consolidated rods.

The utilities will be responsible for loading their spent fuel into licensed, Federally provided transport casks. The Federal Government will then accept title to the spent fuel at the reactor site and transport it to either the MRS or the repository.

2.1.2 Generators of High-Level Radioactive Waste

Liquid commercial high-level radioactive waste is a residual product of the reprocessing of spent fuel for the recovery of useful materials. Only a small amount of commercial high-level waste currently exists. This waste is stored in tanks at a closed commercial plant located at West Valley, New York. After being solidified and prepared for transportation, the waste could be shipped directly from the West Valley site to a repository or to the MRS where it may be combined with other waste for shipment to the repository.

Defense high-level waste is being generated at several DOE facilities, such as those located near Savannah River, South Carolina; Richland, Washington, and Idaho Falls, Idaho. This waste will be solidified at the generation sites into a waste form acceptable for permanent isolation in a licensed repository and then shipped directly to a repository or to the MRS where it may also be combined with other waste for shipment to the repository.

2.2 Monitored Retrievable Storage

Within the context of the proposed system, the MRS facility will (1) receive spent fuel from most or possibly all reactors; (2) consolidate and package, including overpacking of the fuel for permanent disposal in a repository, unless further studies show that overpacking should be done at the repository, and (3) store fuel temporarily pending shipment to the repository. The MRS will be licensed by the NRC. The initial design capacity of the facility is 15,000 metric tons uranium (MTU), but this can be modified as necessary to meet system requirements.

The MRS facilities will be located centrally with respect to the reactors to be serviced. The MRS facility will be designed to receive spent fuel at a rate of 3600 MTU per year. On arrival at an MRS facility, spent-fuel assemblies will be removed from the shipping cask. Each fuel assembly (unless already consolidated) will then be dismantled, and the fuel rods will be consolidated and loaded into canisters. These canisters will be capped, filled with an inert gas, welded shut, inspected, and readied for further handling or packaging operations. The hardware remaining from the disassembly operation will be compacted and loaded into similar canisters.

Canisters that are to be stored at the MRS facility will be removed from a hot cell in which remote fuel handling operations are performed and then stored in dry storage casks, or possibly dry wells. Figure 4 illustrates a concept of the MRS facility and the dry cask storage concept. Vault storage at the MRS is being evaluated.

The spent-fuel canisters will be loaded into licensed transport casks and shipped from the MRS facility to the geologic repository. It is assumed that dedicated trains will be used. The MRS may also repair damaged canisters received from the repository, if needed. As mentioned previously, the lifetime of the MRS is limited to the period necessary to support the emplacement of waste in the repository and the specific period when waste could be retrieved from the repository if necessary.

2.3 Geologic Repository

The geologic repository is designed to provide for the permanent disposal of spent nuclear fuel and high level radioactive waste. At the repository, the canistered waste will be emplaced in a suitable host rock formation approximately 1000-3500 feet below the surface. The repository will be licensed by the NRC.

When fully operational, the repository will be capable of receiving and emplacing the equivalent of about 3,000 MTU of waste per year. The repository is being designed with a disposal capacity of 70,000 MTU.

As illustrated in Figure 5, the repository will consist of both surface and underground facilities. It will be equipped to receive, handle, and emplace underground all of the spent fuel and high-level waste shipped from the MRS facility or from other facilities. The main operations performed in the surface facilities of the repository will consist of: (1) receiving waste canisters; and (2) performing inspections of waste canisters received for emplacement. Additional operations that may be performed in the surface facilities are: (1) the installation of spent fuel canister overpacks if necessary, and if not done at the MRS facility; (2) the installation of overpacks on high-level waste canisters, if necessary, and if not done at the MRS processing facility, (3) repair any damaged waste canisters that are received, if not sent back to the MRS for repairs, and (4) possibly package fuel for disposal received from nearby reactors.

The underground facilities will consist of access shafts, corridors, and emplacement rooms. The waste will be lowered underground and emplaced into boreholes drilled into the floors or the walls of the emplacement rooms. An illustration of an emplaced waste package is shown in Figure 6. The waste will be fully retrievable until it has been demonstrated that the repository is performing within the guidelines set by the NRC (at lease 50 years). The underground facility and shafts will then be closed and sealed, and the surface facilities will be decontaminated and decommissioned.

Current plans call for a second repository to begin operations in the year 2006. It will be similar to the first repository in design, operations, and capacity. The interface between the MRS facility and the second repository will primarily depend upon the relative locations of the MRS, the second repository, and the reactors being served. The necessity for a second MRS facility will be evaluated when the second repository is sited.

2.4 Transportation

The transportation system will have the capability to transport waste from the waste generators to other waste system facilities, as well as between the various facilities of the waste management system. All waste will be shipped in licensed casks designed specifically for that purpose. The DOE will assume responsibility for transport. Depending on the circumstances, waste will be shipped by rail, truck or barge.

Shipments will consist of both consolidated and unconsolidated spent fuel, as well as high-level radioactive waste. Spent fuel will be transported from reactors located in various parts of the country to either the MRS facility or a nearby repository, as well as between the MRS facility and the repository. Solidified high-level radioactive waste will be either transported directly to a repository from the sites at which it was processed or to the MRS for combination with other work forms. The private sector will be relied upon to the extent possible for cask development and transportation operations. Any functions performed by the private sector will be conducted in accordance with the appropriate licensing requirements.

The casks for each transport mode will be designed to accommodate alternative waste forms and canistered waste configurations. Conceptual diagrams of transportation casks are shown in Figure 7.

3.0 Conclusion

This paper describes an integrated waste management system which, when implemented, will satisfy the requirements of the NWPA. Further definition of details of the system and implementation plans are being developed. This integrated system can be implemented only with Congressional authorization for construction of the MRS facility and DOE plans to request such authorization.

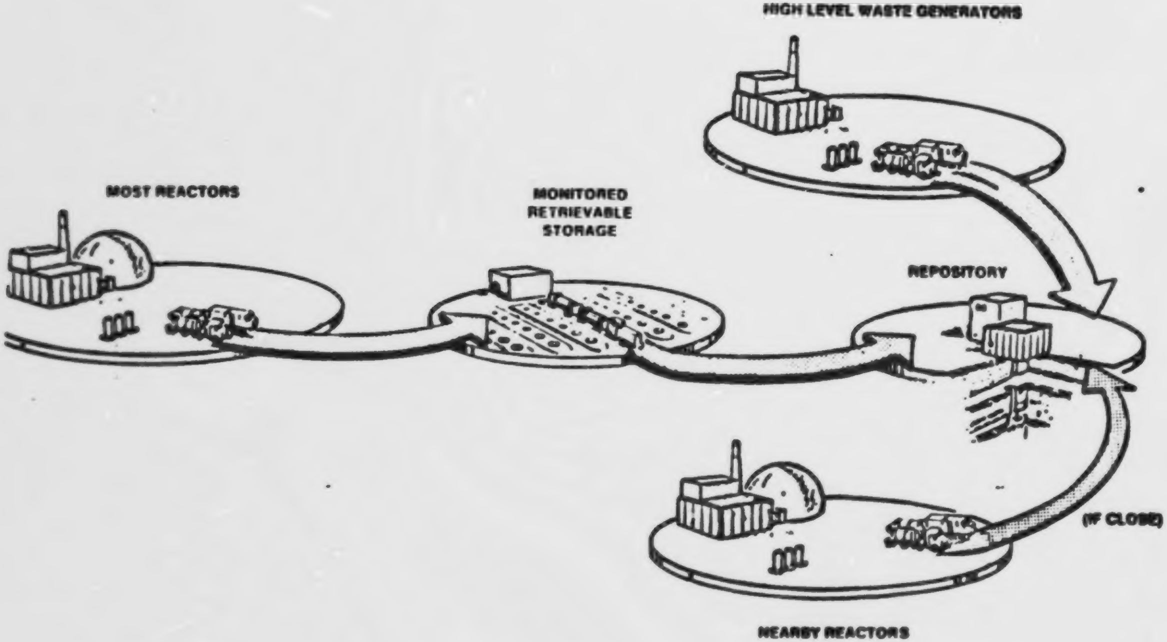
HIGH LEVEL WASTE GENERATORS
MOST REACTORS
MONITORED RETRIEVABLE STORAGE
REPOSITORY
(IF CLOSE)
NEARBY REACTORS

FIGURE 1
ILLUSTRATION OF WASTE FLOW IN THE INTEGRATED WASTE MANAGEMENT SYSTEM

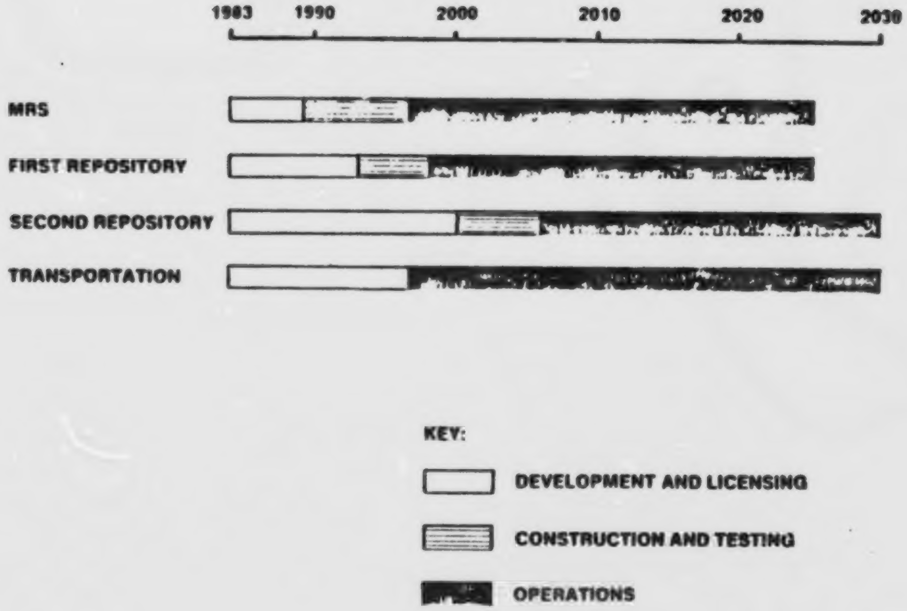

FIGURE 2
SCHEDULE FOR PROPOSED INTEGRATED SYSTEM

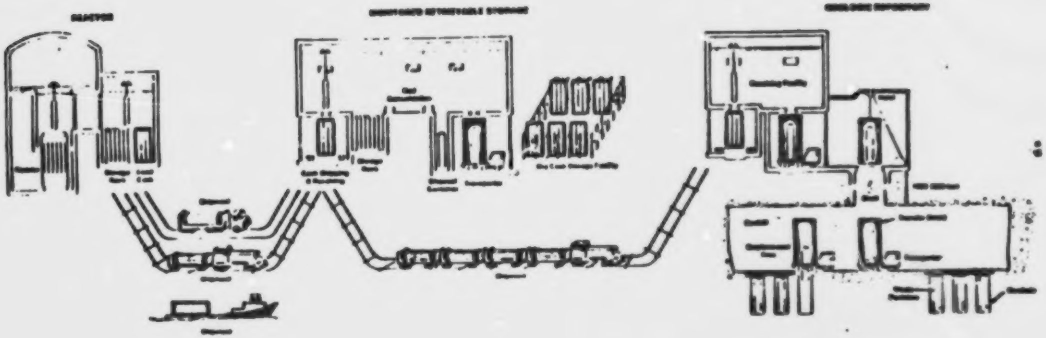

FIGURE 3
INTEGRATED WASTE MANAGEMENT SYSTEM

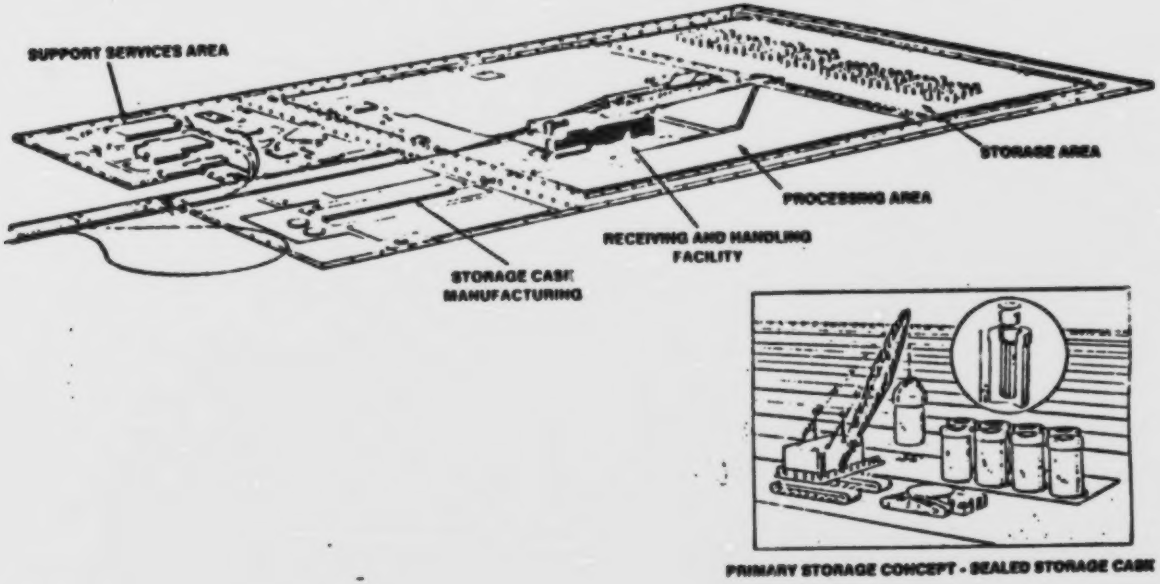
SUPPORT SERVICES AREA
STORAGE AREA
PROCESSING AREA
RECEIVING AND HANDLING FACILITY
STORAGE CASK MANUFACTURING
PRIMARY STORAGE CONCEPT - SEALED STORAGE CASK

FIGURE 4
MONITORED RETRIEVABLE STORAGE FACILITY CONCEPT

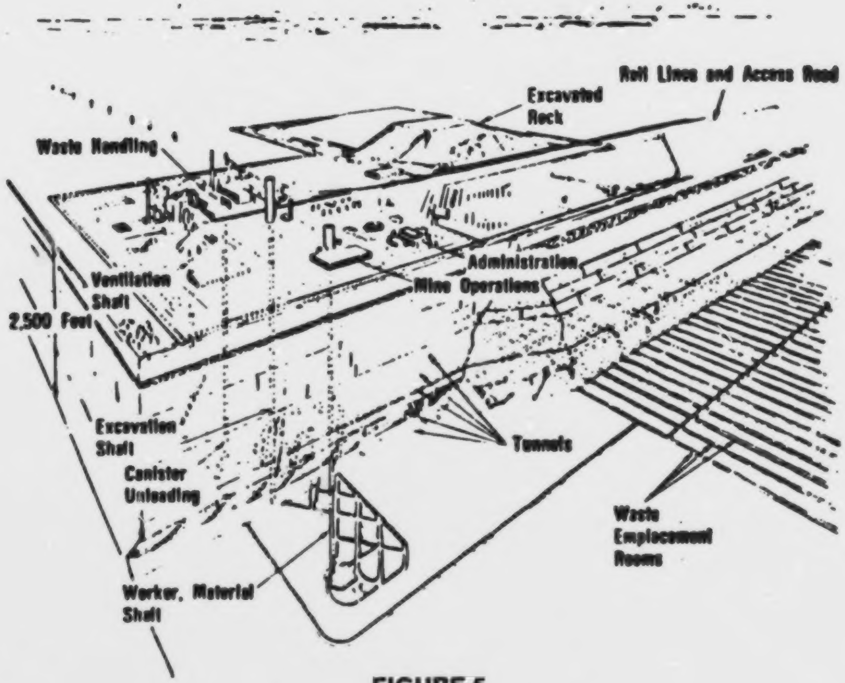
Rail Lines and Access Road
Excavated Rock
Waste Handling
Administration
Mine Operations
Ventilation Shaft
2,500 Feet
Excavation Shaft
Tunnels
Canister Unloading
Waste Emplacement Rooms
Worker, Material Shaft

FIGURE 5
REPOSITORY CONCEPT

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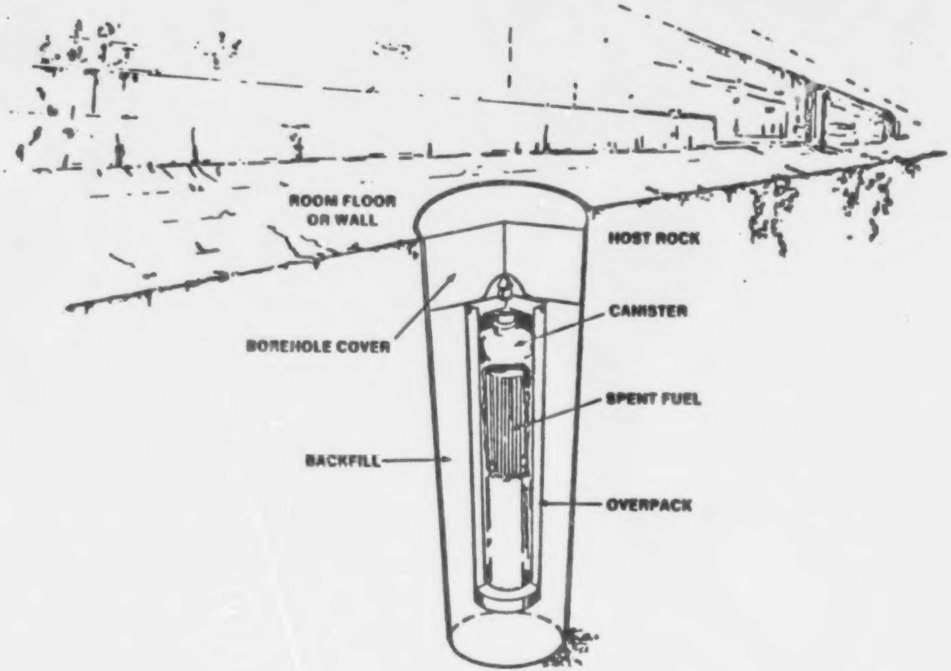

ROOM FLOOR OR WALL
HOST ROCK
CANISTER
BOREHOLE COVER
SPENT FUEL
BACKFILL
OVERPACK

FIGURE 6
WASTE PACKAGE EMPLACED IN REPOSITORY

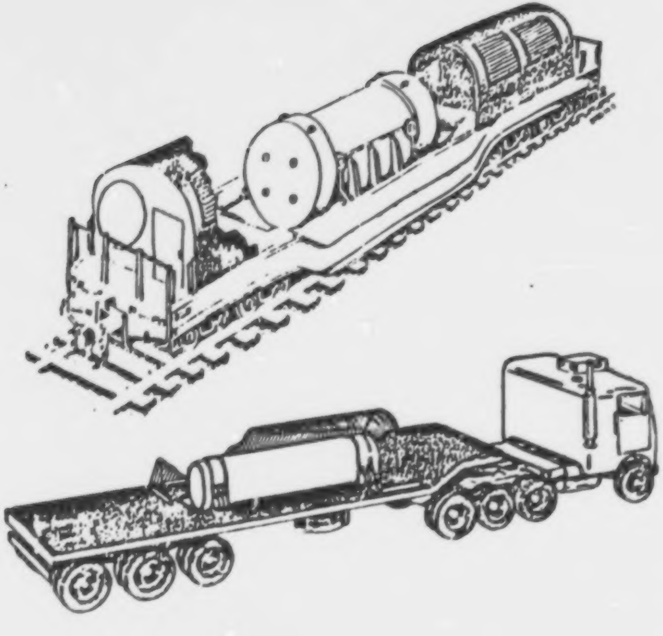


FIGURE 7
REPRESENTATIVE RAIL AND TRUCK TRANSPORT CASK

QUESTION 2: The Department's budget request states that, "Based on preliminary evaluations, the Department currently plans to recommend (in Monitored Retrievable Storage proposal) that Congress authorize the Department to proceed with activities on the critical path for deployment of an MRS facility..." Why is an MRS facility considered essential to the waste management program? Would such a facility be sited centrally or at various locations? Please describe the technology and cost assumptions for MRS facilities. Please describe the specific purpose of MRS and the alternatives considered for fulfilling this role.

ANSWER 2: The Department initially considered MRS as a back-up storage capability to be constructed if there were delays in the availability of the repository. The Office of Civilian Radioactive Waste Management has come to support a role for MRS that does not rely on repository slippage for justification. This MRS would be an integral part of a waste disposal system and would perform many of the functions, particularly waste packaging, traditionally expected to occur at the repository site. Located central to the existing reactors, it would serve as a collection point for wastes, make them repository ready, and improve the transportation system. The repository efforts would then be more focused on the subsurface requirements and the surface facility design, licensing and operating requirements reduced which could also provide additional repository schedule assurances. The MRS could be available sooner than a repository and help provide a more phased implementation of the overall Federal waste

ANSWER 2: (CONTINUED)

disposal system, starting with transportation and packaging for disposal. Improvement in overall system timeliness, availability, flexibility and reliability would be expected. It preserves the repository back-up capability of MRS as well.

To effectively fulfill either an integral or back-up role, MRS facility design must have performance capabilities and flexibility to meet various possible demand scenarios and system needs. The Department has selected storage concepts which are sufficiently mature as to leave little or no uncertainty regarding the ability of the facility to be safely and expeditiously licensed, constructed and operated. Cost assumptions for MRS facilities are based upon facility designs and operational costs prepared by the Department's architect engineer, and on analyses of operational costs for potential MRS applications. Detailed designs and cost estimates are currently being developed to support the mandated proposal to Congress.

QUESTION 3: The budget request includes authorization of $12,900,000 for MRS work in FY 1986. How much of this activity can proceed without specific legislative authorization for construction of MRS? Why is this activity--requiring further authorization, or not--necessary to be undertaken at this time?

ANSWER 3: We believe all the activities identified in the FY 86 budget request can proceed without specific legislative authority for construction of the MRS. These activities include siting analysis, environmental data gathering and analysis, design, design validation, licensing issue analysis, systems support, and program management. It is necessary to undertake these activities during FY 86 because they are on the critical path to MRS deployment and their completion will enable construction as soon as practicable following Congressional authorization as required by the NWPA.

QUESTION 4: The Transportation and Systems Integration activities section of the budget request indicates that "new techniques, systems or facilities could eliminate or minimize many operations previously expected to take place at repository surface facilities." Please describe these techniques, systems and facilities, and the analyses performed to assess their cost, justification, impact on the management system, and deployment scenarios. Please provide the documents representing the analyses of these issues.

ANSWER 4: In 1984, DOE issued an invitation to industry and the utilities for competitive proposals to develop unique ideas for improving the waste management system. Twenty-seven proposals were received and six were selected for award of contracts. These six contracts cover a variety of unique ideas, several of which could result in minimizing operations at the repository surface facilities. Two of these contractors are studying the concept of performing the packaging and handling operations at centralized or regional facilities near the reactors. Three of the contractors are studying the feasibility of "universal" or modular cask and canister concepts that could be used at a centralized packaging facility and, with appropriate overpacks, be suitable for emplacement in any of the geologic media under consideration. The other contractor is studying the feasibility of mobile spent fuel rod consolidation equipment and services that could be used to consolidate fuel at some reactor sites where the option may be of particular merit.

ANSWER 4: (CONTINUED)

These studies are assessing the feasibility of these concepts in terms of their impacts on system costs, health and safety, licensing, and schedule. They are all to be completed by October 1985. Many of the ideas being studied could enhance the operations of the integrated waste management system described in the answer to Question "1" above. Conclusions from the studies will be factored into the design of the integrated waste system, specifically, as they relate to the ongoing design efforts for the repository, the MRS and transportation. Concepts that offer continued promise will be pursued through further design, development and testing. More detailed summaries of each of the six contractors' efforts are attached.

CASK SYSTEMS FOR SPENT FUEL PACKAGING, HANDLING, TRANSPORTATION, STORAGE AND DISPOSAL

The Department of Energy's Office of Civilian Radioactive Waste Management (OCRWM) has awarded Westinghouse Electric Corporation a contract to evaluate three or more integrated metal cask concepts that would result in a reduced number of handling and packaging steps throughout the nuclear waste management system. Westinghouse's subcontractors include Florida Power and Light and Tennessee Valley Authority. The three concepts that will be studied are:

1. Universal Waste Package- This package is an "all-purpose" metal cask which serves the three functions of storage, transportation and disposal at the repository. The cask would serve as a self-shielded waste package that would be loaded, sealed and stored at the reactor site, transported and stored at a Monitored Retrievable Storage (MRS) facility, and emplaced in a repository without ever being reopened. This cask is in fact a disposal canister that has sufficient shielding to preclude the need for remote handling anywhere in the waste management system. The shielding also precludes the need for placing the package in a borehole at the repository, allowing it to be placed directly in the tunnel.

2. Thin-Wall Universal Waste Package with Overpack- In this concept a thin-walled universal canister would be loaded at the reactor site and is not intended to be opened after it leaves the reactor. The canister is placed in an appropriate reusable overpack, for strength and radiation shielding, for storage, and transportation. At the repository, the metal canister is removed from the reusable overpack, and may be placed inside another overpack for emplacement in a borehole. Unlike the reusable overpack, the second overpack is designed for disposal purposes only.

3. Transport/Storage Package with Separate Disposal Package - In this concept, a self-sufficient cask is used for both transportation and storage. The fuel will be transferred to a separate package for borehole emplacement and the T/S cask returned to service.

The study may include additional related metal cask/canister concepts. The study will proceed in five steps. The first step is to define the generic constraints imposed on the systems by DOE and/or the contractor which includes consideration of costs, safety, radiation exposure, flexibility, and applicable regulations and licensing requirements. The second step is to identify and collect the information needed to develop functional criteria, to identify technical, research and development, and institutional issues, and to identify conceptual designs for further study. Where necessary information is not available, it will be developed to the extent needed. The third step is to develop functional criteria which will encompass hardware and other physical (including environmental) features, economics, socioeconomics, and flexibility. In the course of developing the above, research and development needs will be identified; in the process of peer group review, the technical and institutional requirements will be completely defined. This constitutes the fourth step although it overlaps the third step to some extent. The fifth step, preliminary evaluation of the alternatives, will be made using the functional criteria as a ruler. The evaluation will be performed through a combination of three approaches:

- The engineering systems team will screen the information for technical direction and feasibility.
- The peer group of utilities, institutions, and industrial representatives will aid the decisionmaking process, and,
- A decision tree methodology will be used to investigate the combinations and interaction of the decisions which must be made to select the best system.

The study will identify a cask system with the potential to be flexible, to have lower costs, to have lower occuptional and public radiological risk, and without foregoing other options that may eventually be desirable in managing nuclear waste.

The cask system thus identified will be compared with the other PRDA-funded concepts with the objective of selecting the best concept or combination of concepts to be incorporated into the nuclear waste management system.

MULTI-ELEMENT SYSTEM FOR STORING AND TRANSPORTING SPENT FUEL USING A UNIVERSAL CANISTER CONCEPT

The Department of Energy's Office of Civilian Radioactive Waste Management (OCRWM) has awarded G.A. Technologies (with Electrowatt Engineering Services and Duke Power Company as subcontractors) a contract to evaluate a multi-element system for storing and transporting spent fuel which would result in a reduced number of handling and packaging steps. One element, the canister containing spent fuel, will be placed in the three remaining elements, storage casks, closed cycle vault storage modules, and transportation casks. Because the same canister design can be accommodated by different elements, the canister is referred to as a "standard" canister.

In the proposed concept, spent fuel at reactors would be canistered and stored in either intact or consolidated form, with the canister readily transferrable to cask storage, to modular vault storage, or to transport cask without repackaging or redundant fuel handling. Two storage concepts are considered, (a) metal cask storage which is cost effective for a total capacity requirement under 800 MTU, and (b) the modular vault concept which is more cost effective for greater capacity requirements.

The key technical basis of the selection of the multi-element system is comprehensive analysis and understanding of the gross physical inventory of spent fuel requiring packaging, handling, storage, and transportation. For each of the four functions of packaging, handling, storage and transportation, a detailed analysis of the time-dependent spent fuel inventory will be conducted, and the results used (1) to evaluate and develop a standardized canister that maximizes the loading of intact fuel assemblies or consolidated fuel rods and (2) to determine the number of storage and transportation units that minimize the cost and risk of handling, storing, and transporting the spent fuel.

Hardware requirements are then summed to specify a total time-phased requirement for the various system elements (canister, cask(s), and modules) that meet the spent fuel inventory demand.

Two major tasks are envisioned: systems analysis and conceptual design. These are discussed below.

Task 1 - Systems Analysis

An analysis will be performed of the spent fuel inventory, as projected by DOE through the year 2020, and of the missions (at-reactor storage, Federal interim storage, MRS, repository) proposed in the draft mission plan. This analysis will break down the inventory into mission-specific inventories and will provide a time-phased distribution of the spent fuel characteristics. GA will develop a methodology to assist in the system analysis task through application of existing computer software. An inventory computer model and a cost optimization model will be used.

During the last three months of the study, GA will prepare a mission deployment plan and a licensing plan for the system concept. In addition, GA will compare the universal cask concept with the GA-proposed concept.

Task 2 - Conceptual Design

GA will develop a conceptual design of the system concept. Sufficient engineering analysis will be performed in criticality, shielding, thermal, and structural areas to determine a standard canister design and approximate sizes and configuration of the storage and transportation elements.

A cost element and implementation schedule for the proposed multi-element system concept will be prepared. Life cycle costs will be provided on an annual basis and will include capital, operating, and decommissioning costs.

The results of the study will allow OCRWM to compare the GA-proposed concept with the other PRDA-funded concepts with the objective of selecting the best concept or combination of concepts to be incorporated into the nuclear waste management system.

MINIMAX CONCEPT OF PACKAGING AND HANDLING SPENT FUEL

The Department of Energy's Office of Civilian Radioactive Waste Management (OCRWM) has awarded Ridihalgh, Eggers & Associates (REA) a contract to develop and evaluate the "Minimax" concept, a system concept for packaging and handling spent fuel. REA chose that name because the system is intended to have "minimum" impact upon existing components of the fuel cycle, while preserving "maximum" flexibility in the development of future components. The study will be conducted with the assistance of REA's subcontractors Sargent & Lundy, Science Applications and Commonwealth Edison.

The novelty of this concept is the inclusion of one or more "Packaging and Encapsulation Facilities" (P&E) which are intended to receive spent fuel from nearby reactors and to repackage the fuel as needed for shipment to, and emplacement in, repositories.

Such facilities would be regionally located to receive fuel from reactors within about a 250-mile radius which would have been shipped by truck or rail using whatever state-of-the-art casks are available and compatible with the individual reactors. Under these circumstances, there would be minimum impact on the reactors in terms of costs, handling and exposure. The number of reactors making shipment to each P&E facility would be limited to the number of reactors located within the 250-mile radius, and therefore risk and public concern would be reduced.

The P&E facility would be capable of handling all shipments, truck or rail, consolidated fuel or unconsolidated assemblies, and fuel skeletons. It would have the same capability as the front end of currently planned repositories and would prepare the fuel for ultimate emplacement, without further packaging, in any geologic medium. Under this concept, then, any spent fuel handling and resultant exposure, costs, etc., would be limited to large facilities. built with economies of scale, designed for day-in, day-out repackaging by skilled crews. The largest possible rail container would be used to reduce the number of shipments, risk, and exposure, and to permit highest net weights without sacrificing shield strength.

It may be possible to license P&E facilities more quickly than repositories and, at the same time, ease the siting and licensing problems of repositories by eliminating, in large part, major functions of the latter (i.e., packaging and encapsulation).

REA proposes four tasks as described below:

Task 1 Develop System Requirements and Design Bases

System requirements and design bases will be assembled or developed for the components of the nuclear waste management system, including Minimax components. System requirements will include relevant regulations, and statutory and other requirements. Design bases will include the key assumptions that form the bases for sizing facilities, selecting design features and analysis of system performance.

Task 2 Further Develop Minimax Concept

A concept description will be prepared in accordance with the system requirements and design bases developed under Task 1. The description will include all the main components (reactors, P&E facility, MRS, repository, transportation), additional components (Federal Interim Storage, commercial reprocessing, and low-level waste disposal), and institutional relationships (utilities, state LLW compacts, DOE, NRC, states, transportation companies).

Task 3 Develop Subsystem Data Required for Concept Evaluation

The data developed will include assessments of doses, costs, implementation schedules, staffing requirements, etc. This task will result in documents describing the relevant performance characteristics of the major components of the Minimax system.

Task 4 System Characterization

The concept will be characterized and evaluated from the standpoint of cost, safety, licensing, institutional, transportation, safeguards and security, and environmental impacts. The characterization will examine how changes or delays in implementation in parts of the system can affect the system as a whole.

The results of this study will allow OCRWM to compare the Minimax concept with the other PRDA-funded concepts with the objective of selecting the best concept or combination of concepts to be incorporated into the nuclear waste management system.

CENTRALIZED PACKAGING FACILITY TO SUPPORT THE SPENT FUEL MANAGEMENT SYSTEM

The Department of Energy's Office of Civilian Radioactive Waste Management (OCRWM) has awarded E.R. Johnson Associates (JAI) a contract to study the use of a centralized packaging facility (CPF). JAI's subcontractors are International Energy Associates, Ralph M. Parsons, Transnuclear and Nuclear Fuel Services.

The CPF is intended to receive consolidated or unconsolidated spent fuel from most reactors and to repackage the fuel for ultimate emplacement in a repository or for long-term storage in an MRS. The system with the CPF will be compared with the reference system where there is no CPF, and the two repositories and the MRS have their own receiving, handling and packaging facilities. The cost and institutional desirability of the CPF system is to be established and compared with the reference case. Specific attention is to be given to (1) the reduced requirements for receiving, handling and packaging at repositories as a result of using the CPF, and (2) the impact of shipping intact fuel versus consolidated fuel in square (pool-compatible) canisters from reactors to the CPF.

The Centralized Packaging Facility will be a very large, efficient facility capable of receiving truck or rail shipments from reactors, consolidating, and repackaging spent fuel for shipping to and emplacement in a repository. Since shipments to the latter will be in the most efficient package available, the total number of cask-miles will be reduced relative to the reference case.

JAI will perform the analysis in three major tasks as described below.

Task 1 - Development of Packaging System Requirements and Criteria

This task is to establish design criteria for a CPF, minimum requirements for receiving/handling facilities at repositories, and transportation cask design requirements for various spent fuel packages.

The spent fuel packages that will be investigated include intact assemblies, consolidated fuel shipped from reactors in square packages with the same cross-sectional dimensions as the original fuel assembly, and packages suitable for emplacement in each of the three geologic media of salt, tuff and basalt.

Task 2 - Development of Conceptual Designs of a Multi-Purpose Packaging Facility and Associated Systems

This task is to perform a preliminary conceptual design of a CPF, of receiving and handling facilities at repositories, and transport casks for various spent fuel packages. The designs will meet the requirements and criteria established in Task 1 above.

Task 3 - Performance of System Assessments

This task includes estimating costs of facilities and system life cycle costs for the reference case and the CPF case, evaluating the regulatory and institutional acceptability of each case, and comparing the two cases with respect to costs and regulatory and institutional acceptability. In comparing the two cases, sensitivity analysis will be performed with respect to major assumptions such as discount rate, capacities and throughputs, startup dates, etc.

It is anticipated that with the CPF, receiving, handling and packaging facilities at each repository will be reduced sharply; although they cannot be eliminated since there will continue to be direct shipments of spent fuel from nearby reactors and problem shipments from all sources that must be separately handled. Nevertheless, the substantial capital savings combined with the freight savings are expected to offset, more or less, the added costs of a separate facility. Major gains will be reduced public awareness and exposure, eased licensing requirements, reduced environmental impact, improved public health and safety, and probably reduced development risk.

The results of this study will allow OCRWM to compare the Centralized Packaging Facility concept with the other PRDA-funded concepts with the objective of selecting the best concept or combination of concepts to be incorporated into the nuclear waste management system.

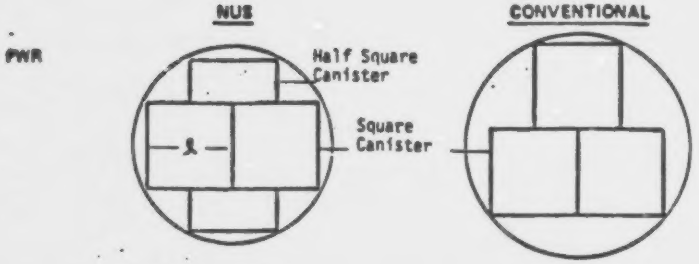
USE HALF-SQUARE AND FULL-SQUARE CANISTERS FOR INCREASED PACKING DENSITY AND DEVELOP DESIGN PARAMETERS FOR TRUCK CASK, STORAGE SILO AND EMPLACEMENT CANISTER

The Department of Energy's Office of Civilian Radioactive Waste Management (OCRWM) has awarded NUS Corporation a contract to investigate innovative canister geometries for increased spent fuel packing density and to develop design parameters for a truck cask, a storage silo and emplacement canisters which take advantage of the increased packing density. Commonwealth Research, an affiliate of Commonwealth Edison, is a non-funded participant in this contract.

NUS has identified certain innovations that have the potential for simplifying and standardizing the packaging and handling of spent fuel, and for reducing costs throughout the waste management system. The NUS concept involves three interrelated ideas:

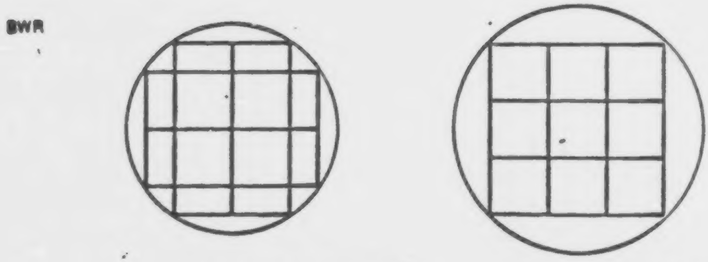
1. Design a rectangular half-square storage canister to hold the fuel rods from single fuel assemblies. Two half-square (rectangular) canisters will fit into a single fuel rack location (in spent fuels pools) which normally accommodates one assembly.
2. Define the optimum geometrical arrays of square and half-square canisters for use in cylindrical storage, transport and waste disposal containers. These arrays would also be evaluated for handling as single undivided unit, similar to a canister, thereby minimizing handling and costs. Figure 1 illustrates how the NUS concept results in less wasted space in the case of smaller cylindrical packages. Cylindrical packages larger than those shown in Figure 1 will also be investigated, expanding on this concept, as shown in Figure 2 for PWR fuel (concepts for BWR fuel would be similar to those shown for PWR fuel).
3. Evaluate the feasibility of a truck cask for shipping spent fuel in the new efficient-geometry arrays of 6 PWR or 16 BWR consolidated assemblies. These arrays sizes appear to be near optimum throughout much of the system.

FIGURE 1
COMPARISON OF NUS SYSTEM WITH
CONVENTIONAL SYSTEM IN WASTE PACKAGE DESIGN


NUS
CONVENTIONAL
PWR
Half Square
Canister
Square
Canister
ℓ

Diameter d = 2.236 ℓ
EFFICIENCY = 0.764
PACKAGE COST = $29,100
= $10.52/kg U

d = 2.577 ℓ
EFFICIENCY = 0.575
PACKAGE COST = $35,900
= $12.96/kg U

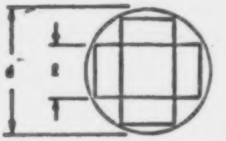


d = 3.606 ℓ (16 ASSEMBLIES)
EFFICIENCY = 0.784
PACKAGE COST = $31,200
= $10.26/kg U

d = 4.243 ℓ (18 ASSEMBLIES)
EFFICIENCY = 0.637
PACKAGE COST = $39,700
= $11.67/kg U

FIGURE 2

BASIC CONFIGURATIONS IN NUS SYSTEM - PWR FUEL
(ALL CONSOLIDATED FUEL)

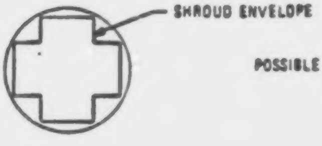


$d^2 = 5\ \ell^2$
$d = 2{,}236\ \ell$
$n = 3$ SQUARES
(5 CONS. ASSEMBLIES)

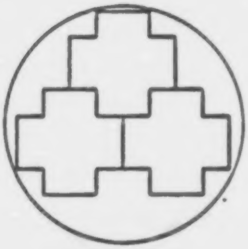
GEOMETRIC EFFICIENCY

$$= \frac{\text{AREA ACTUALLY OCCUPIED}}{\text{AREA WITHIN CIRCLE}}$$

$$= \frac{4 \times n}{\pi \times d^2/\ell^2} = \frac{4 \times 3}{\pi \times 5} = 0.764$$



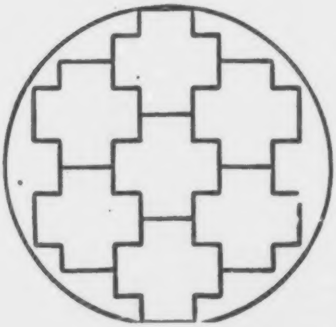
POSSIBLE APPLICATION : – TRUCK CASK SHIPMENT
– FINAL DISPOSAL PACKAGE



$d^2 = 18.1\ \ell^2$
$n = 9$ SQUARES

$$\text{EFFICIENCY} = \frac{4 \times 21}{\pi \times 18.1} = 0.601$$

POSSIBLE APPLICATION: INTERMEDIATE-SIZED
ON-SITE STORAGE
CONCRETE CAISSON



$d^2 = 37\ \ell^2$
$n = 21$ SQUARES

$$\text{EFFICIENCY} = \frac{4 \times 21}{\pi \times 37} = 0.723$$

POSSIBLE APPLICATION: LARGE DRY CASK STORAGE -
LEAD/STEEL CASK

The proposed work has been broken down into major activities as described below.

Task 1 - System/Economic Evaluations

Systems studies will be conducted with respect to packaging, storage, and transportation requirements and costs in order to screen the minimum cost options, to provide system descriptions for use in dose and risk assessments, to evaluate the economics of systems using the NUS designs, and to evaluate present government policies which the system may impact.

Task 2 - Engineering Design

NUS will prepare designs of half-square canisters as a unit and in certain geometric arrays, designs of shrouds encircling the arrays, and cost estimates of the hardware required.

Task 3 - Engineering Analysis

NUS will evaluate arrays of half-square canisters in storage, transportation and disposal containers against existing criteria for limits on temperature, radiation dose, and nuclear criticality.

The results of the study will allow OCRWM to compare the NUS-proposed concept with the other PRDA-funded concepts with the objective of selecting the best concept or combination of concepts to be incorporated into the nuclear waste management system.

EXTRA LARGE STORAGE CASKS WITH TRANSPORTABLE ROD CONSOLIDATION UNIT AND ASSOCIATED EQUIPMENT

The Department of Energy's Office of Civilian Radioactive Waste Management (OCRWM) has awarded Transnuclear a contract to study three interrelated concepts for spent fuel management. Each concept is intended to increase packing density and/or payload and can be used independently. The three concepts are (1) a transportable dry consolidation hot cell that can be moved from one reactor site to another, (2) the use of equilateral triangular cross-section canisters for consolidated fuel, and (3) the largest practical cask for both storage and/or transportation, with either intact or consolidated fuel. Necessary adjuncts are wet and dry transfer casks and lag storage casks for use between the pool and dry operations. Transnuclear's subcontractors are BEI and Commonwealth Edison.

The transportable dry-consolidation hot cell, unlike in-pool consolidation concepts, will require little modification to in-pool storage practices. This will provide a utility with the choice of conducting consolidation with their own personnel, or hiring contractor specialists. In the latter case, the utility will not be burdened with concerns regarding personnel training and equipment procurement and maintenance. The proposed design of the consolidation unit will permit the use of any reasonable size or shape of canister for the rods from assemblies. The contractor proposes the use of canisters with an equilateral triangular cross-section which duplicates the naturally densest packing array possible. While this shape is not, and is not intended to be, compatible with current pool storage and assembly cross-sections, it is the most compatible shape canisters intended to be placed in round casks (for example, six triangular canisters can be grouped to form a hexagonal cross-section).

The high packing density achievable using the above concept will be incorporated into the design of Extra-Large Storage Casks (XLSC) capable of storing at least a reload batch from a typical LWR (about 28 MTU). Even much larger XLSC concepts will be examined. Such large cask capacities will result in decreased unit storage costs.

Successful development of the three concepts would reduce worker radiation exposure, handling, the number of shipments, public awareness and exposure, and costs.

Transnuclear proposes five major tasks as described below:

Task 1 - Design Criteria for Extra Large Storage Cask and Associated Equipment

Conceptual design criteria will be developed for at-reactor spent fuel subsystems which include the following:

1. Four combinations of casks and fuel , i.e., transportable/stationary XLSC's with intact/consolidated fuel.
2. Wet and dry transfer casks.
3. Transportable rod consolidation hot cell.
4. Lag storage or "surge" cask for use between the pool and the dry operations.

Task 2 - Conceptual Design and Feasibility Study of Rod Consolidation Equipment

A conceptual design and feasibility study of the dry mobile hot cell will be performed with respect to safety, licensing, costs, institutional acceptance, and operational characteristics.

Task 3 - Conceptual Design and Feasibility Study of XLSC's

Conceptual designs for the four combinations of casks and fuel will be developed, including designs of auxiliary transfer casks and lifting devices. Transportation constraints will be investigated to determine the largest possible capacity for a transportable cask.

Task 4 - Modifications to Waste System Facilities

Necessary modifications to various facilities in the nuclear waste system will be identified to assure operational success with the new designs.

Task 5 - System Assement

This task will examine the feasibility of the selected conceptual subsystems from the viewpoint of costs, safety and regulatory aspects.

The results of the study will allow OCRWM to compare the Transnuclear-proposed concepts with the other PRDA-funded concepts with the objective of selecting the best concept or combination of concepts to be incorporated into the nuclear waste management system.

QUESTION 5: What is the nature of the Department's current commitment, in policy and/or in contract, relating to the receipt and management of spent nuclear fuel beginning January 31, 1998, and pursuant to Section 302(a)(5) of the Nuclear Waste Policy Act?

ANSWER 5: The "Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste" published in the Federal Register on April 18, 1983 (48 FR 16590), defines the scope of the Department's commitment with respect to acceptance of title of spent fuel (SNF) and/or high-level waste (HWL), transportation and disposal. The contract states "The services to be provided by DOE under this contract shall begin, after commencement of facility operations, not later than January 31, 1998, and shall continue until such time as all SNF and/or HLW from the civilian nuclear power reactors ... has been disposed of."

Secretary Hodel, in a response to Senator J. Bennett Johnston on September 7, 1984, provided the DOE opinion that even in the event a repository is not yet fully operational, "the Act vests the Department with the necessary authority to accept spent fuel and high-level radioactive waste beginning January 31, 1998." A copy of that letter is attached.

THE SECRETARY OF ENERGY
WASHINGTON, D.C. 20585

Attachment. I. b.

September 7, 1984

Honorable J. Bennett Johnston
Ranking Minority Member
Committee on Energy and
  Natural Resources
United States Senate
Washington, D. C. 20510

Dear Senator Johnston:

I am writing in response to your letter of June 21, 1984, which dealt with disposal of spent nuclear fuel under the Nuclear Waste Policy Act. In your letter, you expressed dissatisfaction with the completeness of the General Counsel's response of May 30, 1984, and stated you had requested "an opinion on the legal obligation of the Department and the Department's authority to take title to spent nuclear fuel in the event that a repository has not yet commenced operation" by January 31, 1998.

In our original letter, the Department stated a firm commitment to accept for disposal, on an orderly schedule, high level radioactive waste and spent nuclear fuel not later than January 31, 1998. The Nuclear Waste Policy Act provides clear intent and direction for acceptance and disposal of spent fuel and high level radioactive waste by the Department. The Department is authorized to implement the Act through contractual commitments. To this end, the Department plans to incorporate into its contracts provisions which specify the minimum amount of spent fuel and waste which the Department will be obligated to accept, not later than January 31, 1998. Since these contracts have not yet been modified, it would be premature for the Department to speculate on particulars that might ultimately be incorporated in any or all of the contracts. However, unless waived, the usual remedies and defenses provided to parties contracting with the government would be available. Pursuant to my authority, it is my intention that this commitment in the contracts, together with the overall thrust of the Act, will create an obligation for the Department to accept spent fuel in 1998 whether or not a repository is in operation. This should enable utilities to plan for their projected waste disposal needs with confidence and certainty.

With regard to your question concerning whether the Department has the authority to accept spent fuel and high level radioactive waste in the event a repository is not yet fully operational, I have been advised by the General Counsel that section 302(a)(1) of the Act vests the Department with the necessary authority to accept spent fuel and high level radioactive waste beginning January 31, 1998, in such a circumstance.

As you know, there is much to be done between now and the 1998 date to ensure that we meet this deadline. I would like to personally assure you that the Department is totally committed to achieving this objective.

I hope this information has been helpful and responsive to your request. If I may be of any additional assistance, please do not hesitate to call upon me.

Sincerely,

Donald Paul Hodel

DONALD PAUL HODEL

cc: Honorable James A. McClure
Chairman, Committee on Energy
and Natural Resources

EXTENDED BURNUP

Question 1: What is the scope and status of the extended burnup study being conducted jointly by the Office of Converter Reactor Deployment and the Office of Civilian Radioactive Waste Management? Describe current plans for the burnup program, and the relationship of the study to the plans.

Answer: The study is a joint activity of the Offices of Civilian Radioactive Waste Management (OCRWM) and Nuclear Energy (NE). The NE organization is studying the effects of extended burnup on the front of the fuel cycle and OCRWM is studying these effects on the back end. The OCRWM and NE studies are being coordinated and the the results will be combined into a single executive summary that will provide the total costs and benefits of extended burnup to the entire nuclear fuel cycle.

The two parts of the study are being conducted by contractors who are now nearing the completion of their tasks. We plan to provide Congress with the study consisting of an integrated executive summary report plus the individual front-end and back-end reports at the end of March 1985.

DOE under the Extended Burnup program is continuing existing projects toward completion and is keeping all five domestic fuel suppliers participating in the program. The results of the cost/benefit study should provide a factual basis for a reconsideration of the merits of continued government funding of the program.

COPPER CANISTERS

QUESTION 1: Please provide an overview of the DOE's "Copper Evaluation Plan." Will this plan be the sole basis upon which copper will be evaluated?

ANSWER 1: Copper evaluation plans have been developed for each of the non-salt projects in the first repository program. These plans have been developed in consultation with the Copper Development Association and the International Copper Research Association. The objective of both the basalt and tuff project plans is to comprehensively evaluate copper as a potential waste package material and provide sufficient information so that DOE can decide if copper should be pursued further or eliminated from consideration in the first repository program. The evaluation will include corrosion testing and materials interaction testing under expected repository conditions, structural performance testing, fabrication and welding technology assessment, economics assessment, and design analyses. The evaluation will be completed at the end of FY 1986, and Congress notified of the results.

A briefing on the waste package program, specifically focused on the copper studies, was provided to the staff of the House Interior and Insular Affairs Committee on February 19.

AVAILABLE

QUESTION 2: We have been informed that a preliminary decision on whether to continue the evaluation of copper will be made at the end of the fiscal year. What factors will be considered in making this decision, in comparison to factors that will be considered for the remainder of the evaluation program should the October 1985 determination be favorable?

ANSWER 2: DOE is not planning to make a preliminary determination on copper at the end of FY 1985. The evaluation plans in place in the basalt and tuff projects are based on a two-year testing, design, and analysis program. DOE does not plan on making a decision on whether to pursue copper further or to eliminate it in the first repository program until the completion of the evaluation programs at the end of the FY 1986. However, DOE will report to Congress, in accordance with the requirement of the 1985 Appropriations Bill, the results of our copper investigations through FY 1985.

QUESTION 3: If copper is not chosen for the first repository, will it be considered for the second repository? If so, how extensive will its evaluation program be?

ANSWER 3: Copper will be considered for the Crystalline Rock Project in the second repository program regardless of the outcome of the evaluation studies underway in the first repository program. The evaluation to be conducted as part of the crystalline project will be accomplished as an integral part of the planned waste package design and materials testing activities. These activities are currently planned to be initiated in the FY 1986-1987 time frame at the earliest. The extent of the copper evaluation is currently being planned.

Membership of Process Evaluation Board (PEB)

Peter T. Johnson, Chairman

Education: A.B. - Dartmouth College, Hanover, New Hampshire
M.B.A. - Amos Tuck School of Business Administration

Non DOE Experience: Mr. Johnson's 24 year career in private industry began in 1957 after he had resigned as Captain from the USAF. From 1957 through 1968 he joined the MacGregor Triangle Co. where he rose to the position of Executive Vice President - Administration. From 1962-1968 he was President of the Pressure Treated Timber Co., a wholly owned subsidiary of MacGregor Triangle. This company manufactured and marketed treated structural wood products. In 1968, he joined Trus Joist Corp., becoming President in 1971 and Chief Executive Officer in 1975. Trus Joist is a publicly-owned research, development and marketing company manufacturing roof and floor structural systems. In 1979, he became a private consultant on marketing, financing and manufacturing for several private corporations. One of his activities while a consultant was to advise an aircraft manufacturer of plant layout, production control, engineering, cost control and pricing of a new, FAA licensed aircraft.

DOE Experience: For the past 4 years, Mr. Johnson has been the Administrator of the Bonneville Power Administration (BPA). BPA markets power from the Federal Columbia River System and is responsible for assuring that the resources are available to meet the electricity needs of the Pacific Northwest. His responsibilities include the oversight of the construction and operation of three nuclear generating plants managed by the Washington Public Power Supply System. He serves on the Board of Directors of the Electric Power Research Institute.

James E. Leiss, Vice Chairman

Education: Ph.D. in Physics
University of Illinois, Champaign, Illinois

Non DOE Experience: National Bureau of Standards (NBS)
Dr. Leiss' career at NBS began in 1955. In 1972, he was named Director of the Center for Radiation Research and served in that role until he joined DOE in 1979. In that position he was responsible for NBS research and standards programs in atomic and molecular physics, plasma physics, nuclear physics, and optical, ionizing, and nuclear radiation standards. While at NBS, Dr. Leiss has also served as chairman or participant in program and project review committees in various technical areas on other panels that have made similar evaluations including the Bates Accelerator, the ATLAS superconducting proton accelerator, and charged particle beam technology for the Navy and the Defense Advanced Research Projects Agency. Dr. Leiss left the NBS after 24 years of service in 1979.

DOE Experience: Dr. Leiss joined DOE in 1979 as the Associate Director of Energy Research for High Energy and Nuclear Physics. He has served for 6 years as the principal advisor to the Director of Energy Research in the planning, implementation, and direction of the Department's High Energy and Nuclear Physics programs. Dr. Leiss also served as Chairman of the Process Evaluation Board (PEB) which, in 1982, evaluated and recommended to the Department which Advanced Isotope Separation Process should be selected for further research and development. The charter of this Process Evaluation Board was to evaluate 3 competing advanced isotope separation technologies and to narrow the number considered by DOE for future development from 3 to 1. The Board was not involved in making a decision as to whether that technology was superior to, or should be placed in competition with the ongoing centrifuge program. The recommendations were widely accepted within DOE and outside groups in large part because of recognition of the objectivity and competence of the Process Evaluation Board.

Kermit O. Laughon, Executive Secretary

Education: B.S. in Nuclear Engineering; North Carolina State University
M.S. in Engineering Science; Renessalaer Polytechnic Institute

Non DOE Experience: Mr. Laughon was an analytical engineer at Pratt and Whitney Aircraft from 1961 to 1964. His experience there included work on the design of space nuclear reactor and thermionic power conversion systems. From 1964 to 1968, Mr. Laughon served as a reactor physicist/nuclear engineer with the Tennessee Valley Authority. At TVA, he worked on the Experimental Gas Cooled Reactor Project and on technical and economic bid evaluations that led to purchase of the Brown's Ferry Nuclear Plants.

DOE Experience: Mr. Laughon joined the Atomic Energy Commission (AEC) in 1968. From 1968 to 1973, he served with AEC as Site Representative at the Oak Ridge National Laboratory. During this period, he was involved in nuclear development efforts related to breeder and converter reactors. In 1973, Mr. Laughon transferred to AEC Headquarters in Washington, D.C. From 1973 until his present appointment, he was responsible for the development of advanced nuclear technologies. Since May of 1982, he has held the position of Director, Office of Spent Fuel Management and Reprocessing Systems, under the Assistant Secretary for Nuclear Energy.

C. N. Mitchell

Education: B.S. in Engineering; U.S. Naval Academy
M.S. in Financial Management; George Washington University

Non DOE Experience: Officer, U.S. Navy Nuclear Propulsion Program (Ret. RADM.)

Mr. Mitchell has 32 years' management and technical experience.

DOE Experience: Mr. Mitchell has had and continues to have responsibility for conducting independent assessments of department programs and projects and for overseeing the Department's construction activities. In this capacity, he is responsible for facility real property and utility planning and providing independent cost estimates of programs and projects. His functions include evaluating various program options and recommending to DOE senior management the most cost effective route. He has been conducting these activities for 8 years in the Energy Research and Development Administration and in the Department of Energy.

Norton Haberman

Education: Ph.D. in Chemistry
Case Institute of Technology, Cleveland, Ohio

Non DOE Experience: W. R. Grace & Co.

Dr. Haberman's 6 years' experience at W.R. Grace included development of processes for the production of nuclear fuels. His activities encompassed fundamental investigations as to the nature of the processes through pilot planting of one process which has been commercialized.

DOE Experience: Dr. Haberman joined the Atomic Energy Commission in 1967 and, in the past 18 years, has held positions of increasing responsibility in the area of the nuclear fuel cycle. In 1976, he was named manager of ERDA's Advanced Isotope Separation (AIS) program, which included three processes that were being pursued for uranium enrichment. In 1982, his responsibilities were increased to include management of the Advanced Gas Centrifuge Program. In 1982, Dr. Haberman was a member of the Process Evaluation Board that assessed the potential of three AIS processes in meeting the DOE's long term enrichment needs. The charter of this Process Evaluation Board was to evaluate 3 competing advanced isotope separation technologies and to narrow the number considered by DOE for future development from 3 to 1. The Board was not involved in making a decision as to whether that technology was superior to, or should be placed in competition with the ongoing centrifuge program. The recommendations of this board were widely accepted, due to a large measure because of the recognized objectivity and competence of Dr. Haberman and other members of the PEB. Prior to the time he became involved with the uranium enrichment programs, he had served on numerous committees that evaluated and made recommendations to management about various nuclear reactor and fuel cycle programs.

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Sherry F. Peske

Education: M.A. in Public Policy and Administration
University of Wisconsin, Madison

DOE Experience:

Ms. Peske began her career with the Atomic Energy Commission in 1974 and has over 10 years' experience in the business related activities of the uranium enrichment program. From 1974-1977, Ms. Peske was the principal budget and financial officer in the Office of the Controller for the uranium enrichment program. From 1977-1978, she was the principal financial and contract analyst in the enrichment program office and conducted extensive analysis and evaluations of the commercial and financial aspects of production operations, proposed capacity expansion and supply contracts. From 1978-1980, Ms. Peske was the Special Assistant to the Deputy Assistant Secretary for Uranium Resources and Enrichment. In this capacity, Ms. Peske was responsible for analyses and resolution of key program issues, and the development of integrated policy and strategy alternatives involving all aspects of the enrichment program.

Since December 1980, Ms. Peske has been the Director, Office of Marketing and Business Operations, in the enrichment program, directing enrichment financial management, strategic planning, contracting and marketing functions. She is specifically responsible for developing official estimates of enrichment demand to be supplied by DOE, evaluating market developments and competitor actions, establishing DOE marketing strategies and programs, the terms of DOE sales contracts, and sales prices. Ms. Peske directs extensive economic analyses to identify and assess production alternatives, including the evaluation of advanced technology deployment options and their sensitivity to changes in demand, performance, costs, and schedules. Ms. Peske has chaired and participated in numerous intra- and inter-agency task forces on such subjects as enrichment contract forms and advanced technology deployment alternatives. During 1984, Ms. Peske was responsible for the development of the Utility Services Enrichment Contract and management of contract conversion activities.

Joseph W. Parks

Education: B.S. in Nuclear Engineering
Mississippi State University

DOE Experience: Mr. Parks' entire professional career of 17 years has been at DOE and its predecessor agencies. He is currently responsible for planning activities at the Oak Ridge Operations Office with special emphasis on uranium enrichment and national defense programs. He joined the AEC in 1968 and has continually been given assignments with increased responsibility. His planning activities have included evaluations of gas centrifuge and AVLIS economics and deployment strategies with emphasis on providing DOE customers with an assured supply of enriched uranium in the most cost effective manner. These evaluations have been utilized by DOE management in formulating strategies and plans for the total UE program.

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

FOR RELEASE ON DELIVERY
EXPECTED AT 9:45 A.M.
MARCH 5, 1985

STATEMENT OF
F. KEVIN BOLAND
SENIOR ASSOCIATE DIRECTOR
RESOURCES, COMMUNITY AND ECONOMIC
DEVELOPMENT DIVISION
BEFORE THE
SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT
HOUSE COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
ON
DEPARTMENT OF ENERGY IMPLEMENTATION
OF THE NUCLEAR WASTE POLICY ACT OF 1982

Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to be here today to discuss the Department of Energy's efforts to implement the Nuclear Waste Policy Act of 1982. The act requires us to report to the Congress on the results of an annual audit of DOE's Office of Civilian Radioactive Waste Management. Also, at the request of the Senate Energy and Natural Resources Committee, we prepare quarterly status reports on DOE's program activities. My testimony today is based on our recently issued annual and quarterly reports.[1]

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[1] Department of Energy's Initial Efforts to Implement the Nuclear Waste Policy Act of 1982, GAO/RCED-85-27, January 10, 1985.

Status of the Department of Energy's Implementation of the Nuclear Waste Policy Act of 1982 as of September 30, 1984, GAO/RCED-85-42, October 19, 1984, and Status of the Department of Energy's Implementation of the Nuclear Waste Policy Act of 1982 as of December 31, 1984, GAO/RCED-85-65, January 31, 1985.

In those reports, we noted that DOE has made significant progress toward implementing major legislative requirements. DOE, however, faces a difficult challenge in meeting repository siting deadlines mandated by the act, ensuring adequate financing for the high cost of the program, and enhancing management controls over repository planning and execution. In regard to program financing, we noted the potential for earlier collection of millions of dollars in user fees, and our January 1985 report to the Congress made specific recommendations to the Secretary of Energy to reexamine program financing arrangements.

Before discussing these areas, perhaps some perspective on the Nuclear Waste Policy Act would be useful.

BACKGROUND

The Nuclear Waste Policy Act established a range of federal programs and facilities to deal with storage and permanent disposal of spent nuclear fuel and high-level radioactive wastes.[2] Because of their long radioactive life, these materials must be isolated from the environment for a period of time in excess of 10,000 years. Consequently, the repository program authorized by the act will be a high-cost, long-term effort. DOE estimates that it will cost over $20 billion in the next 50 years to site, construct, and operate two repositories and related activities. The act places the responsibility for paying program costs on the generator or owner of highly radioactive materials. Current costs are being borne by the consumers of nuclear electricity. The act envisioned that states, local governments, Indian tribes, and the public would participate in the planning and development of DOE's program.

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[2] Spent nuclear fuel is the used uranium fuel that has been removed from a nuclear reactor. High-level wastes result from the reprocessing of spent nuclear fuel from commercial reactors, or from defense reactors that are used to produce nuclear weapons material.

SITING WASTE REPOSITORIES

The act established a step-by-step process for the siting of geologic repositories. The Secretary of Energy, in February 1983, notified six states that DOE would further evaluate nine candidate sites for the first repository. These states included Louisiana, Mississippi, Nevada, Texas, Utah, and Washington. Site identification was based on years of federal investigation of three different types of geologic rock formations (basalt, salt, and tuff) for the permanent disposal of highly radioactive materials.

In December 1984, DOE issued general guidelines that will be used to evaluate the suitability of candidate sites. The guidelines specify conditions on such matters as geohydrology and population density that qualify or disqualify any site from development as a repository.

Also in December 1984, DOE announced its intent to propose to the President three sites in Nevada, Texas, and Washington State for detailed on-site tests. This testing program, referred to as site characterization, includes construction of exploratory shafts to depths of a proposed repository. The purpose of site characterization is to gather the detailed information necessary to select a site for repository construction.

Draft environmental assessments on each of the nine candidate sites form the basis for DOE's preliminary site proposals. They are now undergoing public review and comment before being finalized and before the Secretary of Energy makes a formal recommendation to the President. The act required the Secretary of Energy to make this recommendation not later than January 1, 1985, but DOE does not expect to be in a position to do so until at least mid-1985.

Legal challenges could further affect DOE's progress in siting the nation's first waste repository. Beginning in December 1984, at least four lawsuits have been filed by two states, private associations, and individuals in reaction to DOE's siting activities. Courts have been asked to review and set aside the siting guidelines and, specifically, the Texas site selection process. As of the end of February, the courts had not yet addressed the merits of the suits. DOE's General Counsel told us it could not estimate when the cases would finally be adjudicated, or if more cases on these activities might be initiated.

FINANCING THE PROGRAM

The Congress created, as part of the act, the Nuclear Waste Fund to separately account for program receipts and expenses. It also authorized DOE to enter into contracts with generators and owners of highly radioactive materials that would establish specific payment terms. The contracts DOE entered into with nuclear utilities in 1983 represent a major step toward (1) placing the financing responsibility for the disposal program on the generators or owners of highly radioactive materials and

(2) providing the program an assured source of revenues. DOE, however, faces a difficult challenge in assuring adequate program revenues in the long term.

Ongoing fees paid by nuclear utilities are expected to be the major, long-term source of program revenue. For fiscal year 1986, DOE's budget projects receipts of about $401 million in such fees. The act requires DOE to review annually the amount of fees collected to determine whether they will provide sufficient revenue to offset program costs. Reports issued by DOE and the Congressional Budget Office (CBO) in the summer of 1984 indicate that increases in the ongoing fee will be needed to account for the effects of inflation, and possibly real cost growth, at some point in the long life of the disposal program. For example, CBO in August 1984 reported that the Nuclear Waste Fund is extremely sensitive to the effects of annual inflation and nuclear power growth projections. The report noted that to fill two repositories the Fund could accumulate deficits at the present fixed fee ranging between $600 million (high nuclear growth) and $8.5 billion (low nuclear growth).

Aside from the uncertainty in long-term program revenues, we believe that, from a sound financial management and equity standpoint, DOE should fully evaluate ways to more promptly collect fees from all anticipated users of its repository services. DOE has established procedures for the collection and payment of fees for the spent fuel owned by the nation's utilities and other commercial owners. However, DOE has not done so for the high-level wastes (1) produced by DOE defense programs (which account for about 98 percent of the high-level wastes in the United States) and (2) maintained by New York State (which account for the remaining 2 percent). (The latter wastes resulted from a commercial reprocessing plant at West Valley, New York, which operated from 1966 until 1972. New York State subsequently assumed responsibility for maintenance of the West Valley wastes.)

Although we have no overall estimate, we found that DOE might be able to accelerate millions of dollars in payments from these anticipated repository users. Each of the various methods we examined has significant obstacles that DOE would need to address. For example, DOE and utilities would have to agree to contract amendments. Utility representatives told us they would oppose any amendments that would add to utility or consumer costs.

Let me give you examples of various methods that we believe warrant further consideration.

--For utilities generating nuclear electricity, DOE could seek to accelerate payments of ongoing fees by instituting monthly, rather than current quarterly, payment periods. Under present payment procedures, fees for electricity generated in a given quarter are due to DOE 30 days after the end of the quarter. Given the time value of money, collecting these fees each month, rather than each quarter, should result in additional revenues for the Nuclear Waste Fund. We estimated that an additional $2.7 to $8 million annually could result from monthly collections. The $2.7 million figure assumes payment of fees 30 days after the end of each month, as is the practice utilities use to charge residential customers for electricity. The $8 million figure assumes DOE would use estimated monthly billing procedures and collect the fees at the start of each month, a practice Treasury urges agencies do in related circumstances.

--For commercial owners of previously discharged spent fuel, DOE could seek to subject deferred payment of one-time fees to commercial, rather than the current Treasury, interest rates. Based on DOE estimates, such commercial owners (mostly utilities) owe the Nuclear Waste Fund a total of $2.3 billion in one-time fees. DOE has given them until June 1985 to select one of three deferred payment options. Two of the options involve payment of compound interest from April 7, 1983, at Treasury rates. The third is an interest-free option, if the utility elects to make full payment before June 30, 1985, or 2 years after it signs a contract with DOE, whichever comes later. Given the difference between commercial and Treasury rates (commercial rates were about 2 percent higher than Treasury rates when we made our analysis), applying a commercial rate of interest should result in additional revenues to the Fund. For example, we estimated that if all utilities chose an interest option using commercial rates, the Fund could realize additional revenues of $20.7 million annually for 10 years in one instance and $46 million annually for up to 15 years in the other instance. Treasury strongly supports subjecting the deferred payments to commercial, rather than Treasury, interest rates.

--For defense high-level waste it owns, DOE could seek appropriations to begin payments in fiscal year 1986 or 1987 if the President does not determine that use of a separate repository for such defense waste is required. DOE transmitted a report to the President on February 6 that recommended defense waste be disposed of in the same repository as commercial waste, primarily for cost-saving reasons. If the President concurs in DOE's recommendation, the act requires DOE to "proceed promptly with arrangement" for allocating costs of repository development between commercial and defense waste. DOE has estimated that disposing of defense wastes in the commercial repository would add between $758 million and $1.5 billion in construction and operating costs. A portion of the costs for development and evaluation activities for the commercial repository, estimated at about $4.5 billion, would also have to be allocated to the defense waste, but a final allocation mechanism has not been agreed upon. Accordingly, we were not able to develop estimates of additional revenues that could accrue to the Nuclear Waste Fund from DOE payments.

--For high-level waste maintained by New York State, DOE could seek accelerated payment of funds held by the state for the care of such waste under contractual arrangements that pre-date the Nuclear Waste Policy Act. In June 1983, DOE urged New York State to "prudently manage" about $5.5 million that had been set aside for the "perpetual care" of these wastes. At that time, DOE envisioned that the $5.5 million, considering compound interest, would sufficiently cover New York's obligation to pay the disposal costs of the West Valley waste by the time the first repository is scheduled to become operational in 1998. We did not evaluate whether the amounts in New York State's perpetual care fund would be adequate to recover a fair share of DOE's costs. All other anticipated users of DOE's repository services are required to deposit fees into the Nuclear Waste Fund in advance of disposal to pay for the costs of repository development. If DOE seeks prompter payment from New York State, an amendment to a cooperative agreement between DOE and New York State would be needed. DOE must first decide, however, what is an appropriate fee to charge to the disposal of all high-level wastes--defense wastes as well as those maintained by New York State.

We recommended that DOE (1) evaluate ways to more promptly collect fees from all generators and owners of highly radioactive materials and (2) establish fees for the disposal of high-level wastes owned by the federal government and maintained by New York State. In commenting on our annual report, DOE said it is exploring alternatives to improve the program's revenue stream and that our recommendations were under study.

PROGRAM ORGANIZATION

Organizationally, it has been a difficult transition period for DOE's nuclear waste disposal program. DOE had to restructure its organizational responsibilities at headquarters to put the Waste Office in place and staff it. At the same time, DOE had to begin implementing the act's requirements. In addition, the DOE Waste Office was headed by two different acting directors until the appointment of a permanent director in May 1984.

DOE has put in place a headquarters office to direct the overall program, but its managers do not have the authority to directly control the field staff who execute the program through a multitude of contractors. The field staff are assigned, controlled, and evaluated by managers in DOE's field offices. For fiscal year 1984--the first year a separate personnel authorization was established for the act's implementation activities--about half of the 191-staff-year ceiling was allocated to three DOE field offices. These field offices during fiscal year 1983 obligated, under 210 prime contracts or subcontracts, almost 90 percent of the program's $254 million in available appropriations.

Under this decentralized field management approach, which is typical of most DOE programs, the DOE Waste Office will need to pay particularly close attention to developing strong management controls over repository planning and execution. The DOE Waste Office recognizes the importance of this consideration and has taken actions to establish such controls. For example, beginning in fiscal year 1985, DOE upgraded its capability to collect more detailed cost data on program subactivities. Moreover, DOE is in the initial stages of designing a program-wide planning and control system as a means to measure actual performance in accomplishing technical, cost, and schedule objectives.

UPCOMING PROGRAM EVENTS

Before concluding my remarks, Mr. Chairman, I would briefly like to note a few additional program activities required by the act that could set the program's pace and direction for many years to come. These are the Department's mission plan, anticipated to be submitted to the Congress this May, and the Department's proposal for the construction of government facilities for the long-term storage of radioactive waste, due to the Congress this June. The mission plan will present DOE's strategy for implementing the act and will become effective 30 calendar days after it is received by the Congress. Regarding government storage facilities, congressional authorization is required for their construction. DOE's recent budget assumes congressional authorization to proceed with activities that DOE believes are critical for the deployment of storage facilities, namely siting and licensing. I have attached to my prepared statement a listing of other key program events.

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That concludes my prepared statement. We will continue to monitor and evaluate selected activities and program initiatives of DOE's Waste Office through forthcoming annual audits and our quarterly status reports. We will be pleased to answer any questions at this time.

ATTACHMENT A:

KEY EVENTS IN DOE WASTE PROGRAM DURING 1985

Event	Date Anticipated by DOE
President's determination on commingling defense high-level waste in a commercial repository (sec. 8 of NWPA)	Unknown - DOE transmitted its report to the President on February 6.
Submission of DOE's study to the Congress on alternative approaches to financing and managing DOE's program (sec. 303)	3/85
Submission of the Mission Plan for a 30-day congressional review period prior to its use as the basis for program decisions (sec. 301)	5/85
Submission of proposal to construct one or more government storage facilities for congressional review and authorization (sec. 141)	6/01/85
Publication of final environmental assessments (sec. 112)	8/85
Nomination of 5 sites as suitable for characterization (sec. 112)	Late Summer 1985
Recommendation to the President of 3 sites for site characterization (sec. 112)	Late Summer 1985
President's approval/disapproval of Secretary's recommendation (sec. 112)	Fall 1985

APPENDIX II

FRIDAY, FEBRUARY 7, 1986

ADDITIONAL MATERIAL SUBMITTED FOR THE HEARING RECORD

STATEMENT OF
JAMES W. VAUGHAN, JR.
ACTING ASSISTANT SECRETARY FOR NUCLEAR ENERGY
U.S. DEPARTMENT OF ENERGY
BEFORE THE
SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
U.S. HOUSE OF REPRESENTATIVES

FEBRUARY 7, 1986

Mr. Chairman, I am pleased to have the opportunity to discuss two major segments of the Department's nuclear energy programs--our Remedial Action and Waste Technology program, including efforts on low-level waste, and our Uranium Enrichment activities.

Answers to the questions on uranium enrichment posed in your January 22, 1986, letter of invitation have been provided to the Subcommittee.

To place this discussion in perspective, the following table shows our FY 1987 budget request for these two programs plus our Nuclear Energy Research and Development (R&D) programs.

	----($ in Millions)----	
Program Element	FY 1986 Estimate	FY 1987 Request
Nuclear Energy Supply R&D		
Nuclear Energy R&D	$ 375.7	$ 330.9
Remedial Actions & Nuclear Waste Technology	230.0	294.1
Policy and Management	1.7	1.8
Total	$ 607.4	$ 626.8
Uranium Enrichment		
Uranium Enrichment Activities	1,550.4	1,051.4
Payback to Treasury	0*	235.0
Uranium Enrichment Revenues	1,360.6	1,286.4
Net Uranium Enrichment	$ 189.8	$ 0

* Revenues in excess of outlays of approximately $110 million will accrue to the Treasury in FY 1986.

OVERVIEW

As noted in the above table, our funding request in FY 1987 for Nuclear Energy Supply R&D is $626.8 million in budget authority, as compared to $607.4 million estimated in FY 1986. The FY 1986 figures in this and subsequent tables reflect appropriated totals reduced by sequestrations responsive to Public Law 99-177 (the Gramm-Rudman-Hollings Deficit Reduction Act), management initiatives, and other general reductions. The FY 1987 Uranium Enrichment request reflects both planned partial payback of prior Government investment and offsetting revenues, resulting in a net zero appropriation for that activity.

This past year has been one of significant change and hard choices for many of our nuclear energy programs. Primarily, these changes have been prompted by fiscal constraint. We place high priority on ensuring that nuclear energy continues to contribute to a strong, stable, and secure national energy base to meet both civilian and military requirements. Nuclear energy, along with fossil and renewable energy sources, are essential elements to achieving that goal at reasonable cost. The Department's commitment to nuclear energy remains strong; our execution of a reliable, competitive, and businesslike uranium enrichment enterprise is an integral part of our commitment. The Department also remains strongly committed to protecting public health and safety and to assuring a safe and clean environment in connection with its activities. Our remedial action and waste technology efforts are an integral part of that commitment.

While the FY 1987 budget request for Nuclear Energy Supply Research and Development programs increases slightly from our FY 1986 estimate, there have been several shifts in emphasis within that budget. Within that essentially level budget, our funding request for nuclear energy research and development (R&D) has decreased by about $46 million dollars, while funding for Remedial Actions and Waste Technology has increased by some $64 million dollars compared to FY 1986.

Key factors that influenced the shifts in program priorities and our budget request include:

First, the Department is fully committed to support the bipartisan effort to control and reduce the Federal deficit. In this necessary environment of fiscal constraint, we are constantly faced with difficult choices among deserving programs. Although it may appear to some that worthwhile R&D elements have been eliminated or significantly reduced, we believe that each of our programs is sharply focused to make optimum use of limited resources.

Second, space and defense nuclear energy needs are increasing, particularly those associated with the Strategic Defense Initiative (SDI). Some of our activities in this area have progressed from the design and screening phase into the more funding-intensive hardware phase. These activities are an essential part of a top national priority. Accordingly, our funding request for these efforts in our nuclear energy R&D programs have increased in FY 1987. Certain benefits derived from the nuclear energy R&D work to support these national security requirements will be applied to future civilian reactor development efforts and some complementary base technology activities will continue.

Third, the currently anticipated timing for the commercial introduction of innovative reactor technologies beyond light water reactors has been stretched out. Accordingly, our funding request for civilian advanced reactor development activities has been reduced in FY 1987, consistent with this stretched-out timing and other nearer-term priorities including space and defense activities. Last year, we testified to our conviction that the institutional impediments to the near-term deployment of Light Water Reactors (LWRs) must be overcome before there would be any chance to realize the potential of advanced reactors. This conviction is reflected in the priorities within the funds available for reactor research and development. Our Light Water Reactor R&D program is more sharply focused on safety and related programs, including continued evaluation of the Three Mile Island accident, that would enable implementation of the needed reforms and help lead to the completion and certification of advanced, state-of-the-art LWR designs.

Fourth, the Remedial Actions and Waste Technology budget request increases by $64.1 million compared to the FY 1986 estimate. The program objectives can be achieved at this level of funding by extending the authorization period for the Department's Uranium Mill Tailings Remedial Action (UMTRA) Program from March 1990 until the end of FY 1993, consistent with the guidance provided in House Report No. 99-195 accompanying the FY 1986 Energy and Water Development Appropriations Act (Public Law 99-141). We will formally request such an extension later this year. Emphasis in all remedial action programs will concentrate on cleanup activities at highest priority sites and the continued protection of the public and the environment at all sites.

Finally, the Uranium Enrichment budget request reflects several strategic decisions made by the Department during the past year. Chief among these are placing of the Oak Ridge (Tennessee) Gaseous Diffusion Plant in standby, termination of the GCEP project, and selection of the Atomic Vapor Laser Isotope Separation (AVLIS) process as the advanced uranium enrichment technology for the U.S. in the 21st Century. During FY 1986, the Department will initiate an effort to transfer development and ultimate deployment of the AVLIS technology to the private sector. The FY 1987 budget request reflects these decisions.

More detailed discussion of these factors and the scope, status, and budget request for our programs is contained in the sections that follow.

REMEDIAL ACTION AND WASTE TECHNOLOGY

The objectives of the Remedial Action and Waste Technology Program are to treat or stabilize radioactive wastes and perform decontamination and decommissioning at contaminated DOE and legislatively-directed nongovernment facilities and sites; help facilitate development of a reliable national system for managing low-level radioactive wastes; and develop acceptable technologies for the treatment and immobilization of all types of nuclear wastes.

The major Remedial Action and Waste Technology activities are: (1) the Formerly Utilized Sites Remedial Action Project (FUSRAP); (2) remedial action at Grand Junction, Colorado (Public Law 92-314 as amended); (3) the Uranium Mill Tailings Remedial Action Project (UMTRAP) for inactive uranium mill tailing sites (Public Law 95-604); (4) the Surplus Facilities

Management Program (SFMP), for certain radioactively contaminated DOE facilities declared surplus and resulting principally from civilian nuclear energy programs; (5) demonstration of the solidification of high-level radioactive wastes at West Valley, New York, for final disposal (Public Law 96-368); (6) technical assistance to States and regions to assist them in developing new capacities for the disposal of low-level radioactive waste, in accordance with Public Law 96-573, the Low-Level Radioactive Waste Policy Act, and Public Law 99-240, the recently enacted amendments to this legislation; (7) research and development of generic nuclear waste treatment processes and waste forms suitable for transportation, storage, and ultimate disposal in a geologic repository; and (8) civilian byproducts utilization and applications with primary emphasis on food irradiation.

The requested funds for the Remedial Action and Waste Technology Program are distributed among the program elements as indicated in the following table:

	($ in Millions)	
Program Element	FY 1986 Estimate	FY 1987 Request
Remedial Action and Waste Technology		
Formerly Utilized Sites	$ 18.9	$ 25.6
Grand Junction	0.9	0.8
Uranium Mill Tailings	91.4	126.0
Surplus Facilities	39.9	56.4
West Valley	61.6	79.0
Low-Level Waste	4.6	4.0
Waste Treatment	6.2	0
Byproducts Utilization	4.8	0
Program Direction............................	1.8	2.3
Total	$230.1	$294.1

FORMERLY UTILIZED SITES REMEDIAL ACTION PROJECT

FUSRAP provides for remedial actions at former nuclear processing facilities which became radioactively contaminated as a result of former Manhattan Engineer District or Atomic Energy Commission (MED/AEC) activities and which have not been decontaminated sufficiently to meet current public health and safety guidelines. FUSRAP also includes certain contaminated sites specifically assigned to DOE by Congress for remedial action.

To remedy the situation at these contaminated sites, either the contaminated material will be stabilized in place, with restrictions placed on the use of the site, or the contamination will be removed and disposed of at another location. Authority currently exists, derived from the Atomic Energy Act of 1954, for conducting remedial actions at 24 sites, based on a review of the involvement of the Department's predecessor agencies in activities at these sites. In 1985, this review process led to the addition, by the Department, of the following 4 sites (included in the total of 24 cited above) to the project: (1) former Bridgeport Brass Company, now a General Motors property (Adrian, Michigan); (2) former Bridgeport Brass Company, now Seymour Wire Specialty (Seymour, Connecticut); (3) National Guard Armory (Chicago, Illinois); and (4) former Metal Hydrides, Incorporated, now Ventron Division of Thiokol Chemical (Beverly, Massachusetts). Review of other sites involved in past activities of the Department's predecessors is continuing and is scheduled to be completed in 1987. This review may result in the addition of other sites to the program.

Congress added four sites in the FY 1984 Energy and Water Development Appropriations Act (Public Law 98-50), with direction to initiate a decontamination research and development project at these sites as a priority action. In the FY 1985 Energy and Water Development Appropriations Act (Public Law 98-360), Congress directed DOE to acquire the former St. Louis Airport site and use it to dispose of waste from cleanup of the nearby Latty Avenue site and vicinity properties. Congressional and Departmental additions bring the total number of sites in the project to 29.

The Department's Oak Ridge Operations Office has the lead role in implementing the Formerly Utilized Sites Remedial Action Project.

In FY 1985, the cleanup of the contaminated central drainage ditch leading from DOE-owned Niagara Falls Storage Site at Lewiston, New York, was completed for a distance of about 1 1/2 miles. In FY 1986, the Department expects to complete cleanup work at the remaining four contaminated properties near this site. Work will be completed on the installation of an interim cap on the waste storage area, about 9 months later than originally planned. This delay was due to technical problems in transferring the radium-contaminated residues from a concrete tower to a storage location and in treating large quantities of impounded water to meet stringent State standards for discharge. Other remedial actions at this site are described under the Surplus Facilities Management Program.

The Department is planning to complete the remedial actions at the Middlesex Landfill in New Jersey in FY 1986 that were about 50 percent completed in FY 1984. No cleanup work was done on this site in FY 1985.

This is about 21 months later than originally planned, due to a large increase in the estimated volume of contamination and the higher priority assigned to the Maywood, New Jersey, remedial action.

Decontamination actions begun in FY 1984 and continued in FY 1985 are underway in FY 1986 at Maywood, New Jersey; Wayne, New Jersey; and Colonie, New York. The general approach to these projects is to give priority to the cleanup of contaminated residential properties and to store the waste temporarily on each processing and storage site. The cleanup of residential properties in Maywood, contaminated with material from the Stepan Chemical Company site, was completed in FY 1985, along with some residential properties found to be contaminated from the Stepan site in the adjacent town of Lodi. The contamination from the Stepan site has been found to be more extensive, extending into Lodi and under New Jersey Route 17. In FY 1986, cleanup of one Maywood commercial property continues. Extensive characterization of the contaminated areas and engineering for further remedial actions will be completed. The waste from this site is being stored on an 11.7 acre part of the Stepan Company property at Maywood which Stepan donated to DOE in 1985 along with $580,000. The storage pile was expanded in 1985 and modified to meet State requirements. The Department expects to complete by March 1986 a study of options for permanent disposition of the more than 270,000 cubic yards of waste.

At Wayne, New Jersey, the cleanup of a ball field and a bus yard was completed in FY 1985, interim stabilization of the waste on site was begun, and onsite monitoring wells were installed. In FY 1986, about one-third of the cleanup of Sheffield Brook and cleanup of residential properties bordering the brook will be completed. Modifications are being made to the site so that wastes can be stored on the site temporarily. The site is considered unsuitable for permanent stabilization because of ground water flow. The State of New Jersey has been requested to nominate candidate locations in the State for DOE to establish a site for disposal of the estimated 50,000 cubic yards of waste at Wayne, as well as the other estimated 360,000 cubic yards of FUSRAP waste at Middlesex and Maywood.

At Colonie, New York, DOE acquired the NL Industries site as a donation in February 1984, along with two adjacent parcels owned by the Niagara Mohawk Power Company that have waste buried on them. Radiological surveys of a total of 130 vicinity properties have been completed through FY 1985, and of these, 54 properties need remedial action. About 90 to 100 additional properties remain to be surveyed. Cleanup of 35 properties was completed by October 1985 (11 in FY 1984 and 24 in FY 1985) and all remaining properties will be completed by October 1987. The contaminated soil is being temporarily stored inside the plant. The Department expects to complete, by March 1986, a study of options for the permanent disposition of the more than 30,000 cubic yards of waste. The State has been requested to nominate candidate locations for a DOE disposal site in New York. In FY 1986, the Department is also disposing of radioisotope sources previously used for inspection work and of hazardous chemicals in the plant.

At Hazelwood, Missouri, DOE has arranged with the site owner, Futura Chemicals Company, to use a part of the site for storage of contaminated soil. Cleanup of a portion of Latty Avenue, adjacent to the Hazelwood site, was initiated in FY 1984 and was completed in FY 1985. Border areas on the site were cleaned up to prevent recontamination of Latty Avenue, and fencing was installed around the site. Radiological surveys of the vicinity properties were performed in FY 1985, and a survey of the developed part of the Latty Avenue site will be started in FY 1986. Cleanup activities on the remaining vicinity properties will not be started until the waste can be moved to the St. Louis Airport Disposal site. The City of St. Louis, Missouri, is considering the terms of transfer of the former St. Louis Airport Storage site to the Department for use in disposing of the estimated 60,000 cubic yards of waste from the Hazelwood site and vicinity properties, as required by language contained in the report that accompanied the FY 1985 Energy and Water Development Appropriations Act (Public Law 99-360). In FY 1985, DOE installed a 300-foot rock wall (gabion) at the Coldwater Creek bank of the Airport site to prevent erosion from spreading contamination into Coldwater Creek. In FY 1986, further site characterization (radiologic and geologic) work will be started and this work will be completed in FY 1987. Preliminary design work, initiated in FY 1986, will be completed in FY 1987.

A revision to the FUSRAP Project Plan was completed in FY 1985. A preliminary total cost estimate of $675 million has been made for the FUSRAP scope, consisting of 25 sites, based on completion of all the work by the year 2001. The Plan will be updated in FY 1986 to include the four additional sites added by the Department in FY 1985.

GRAND JUNCTION REMEDIAL ACTION PROJECT

Under Title II of Public Law 92-314, Congress authorized financial assistance to the State of Colorado to limit radiation exposure resulting from the use of uranium mill tailings for construction purposes in Grand Junction, Colorado. This State and Federal cooperative effort is administered by the Colorado Department of Health through DOE's Grand Junction Area Office. The remedial action provides for removal of uranium mill tailings from the premises of an estimated 583 structures where concentrations of radioactive radon and its decay products exceed guidelines established by the Surgeon General. Public Law 95-236 extended the time, which has now expired, for property owners to apply for inclusion and also increased the authorized funding for the program. Federal funds cover 75 percent of the program costs, with the State providing the balance. Contingent upon the availability of adequate funding from the State of Colorado, the remedial action is expected to be completed in FY 1987, with final radiological verification to be completed in FY 1988.

At the end of FY 1985, work had been undertaken on 546 structures. In FY 1986, radiological assessments will be continued, engineering on all properties will be completed, and remedial actions will be initiated at 20 additional structures, including 17 residences, 2 commercial establishments, and 1 church. In FY 1987, work is scheduled to be undertaken on 15 properties, including 6 commercial structures, bringing the total number of properties completed to 581 out of the estimated total of 583.

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT (UMTRAP)

UMTRAP is responsible for conducting remedial action at 24 former uranium ore processing sites and several thousand contaminated vicinity properties, as mandated by Public Law 95-604, the Uranium Mill Tailings Radiation

Control Act of 1978. Nine of the sites are designated as high priority, six as medium priority, and nine as low priority. The Act provides authority for remedial action by the Department for a period of 7 years following promulgation of standards by the Environmental Protection Agency (EPA), which occurred in March 1983.

The Department is proposing to extend the 7-year authorization period until the end of FY 1993, consistent with the recommendation to extend the duration of the project made by the House Appropriation Committee in House Report No. 99-195 accompanying the FY 1986 Energy and Water Development Appropriations Act (Public Law 99-141). The FY 1987 budget request identifies resource requirements to meet this extended schedule. The proposed extension takes into consideration the actual project experience gained in performing remedial action at several processing sites and many vicinity properties. Project plans have been revised to reflect this experience, and are based on the following key assumptions: (1) 4,535 of the 8,156 designated vicinity properties will actually require clean up in accordance with EPA standards; and (2) seven of the tailings piles (i.e., Durango, Colorado; Grand Junction, Colorado; Gunnison, Colorado; Rifle, Colorado; Bowman, North Dakota; Lakeview, Oregon; and Salt Lake City, Utah) will be relocated.

The program strategy is to focus near-term program activities on the higher priority sites and on vicinity properties. Remedial actions are being conducted in accordance with cooperative agreements negotiated with the affected States and Indian tribes. Federal funds cover 90 percent of the remedial action costs (100 percent for the sites on Indian lands), and the States provide funding for the remaining 10 percent. The type of remedial action for the processing sites will be to stabilize the mill tailings in place, where possible, or to remove them to a new disposal site. In either case, the final disposal sites will be Federally owned and maintained under Nuclear Regulatory Commission (NRC) licenses. Engineering plans and environmental documents are prepared for each site cleanup and disposal operation. Concurrence by the NRC and the affected State or Indian tribe are required for the remedial action plan at each site. The project also involves the cleanup of an estimated 4,535 contaminated vicinity properties mainly in the Grand Junction area but not covered by the Grand Junction Remedial Action Project. The Department's Albuquerque (New Mexico) Operations Office has the field management responsibility for implementing UMTRAP.

Specific accomplishments in FY 1985 included the completion of 90 percent of the remedial action at Canonsburg, Pennsylvania, and initiation of remedial action at Salt Lake City, Utah; and Shiprock, New Mexico. The implementation of the remedial action at the Salt Lake City processing site has been assigned to the State of Utah. The approach at this site is to relocate the tailings to a site near Clive, Utah. Cleanup continued at high-priority vicinity properties near the sites at Canonsburg, Pennsylvania; Salt Lake City, Utah; Grand Junction, Colorado; and Edgemont, South Dakota; and started at Shiprock, New Mexico; Riverton, Wyoming; and Durango, Colorado.

During FY 1986, work is underway or planned at five processing sites. The Canonsburg project will be completed early in the fiscal year. The work at Salt Lake City will be brought to an estimated 70 percent of completion, and the work at Shiprock will be 90 percent completed. Onsite work will be started at the processing sites at Tuba City, Arizona, and Lakeview, Oregon. Over 400 vicinity properties located at several high-priority sites will also be decontaminated.

During FY 1987, remedial action will be underway at 9 processing sites and 900 vicinity properties. The work at Shiprock, New Mexico, and Salt Lake City, Utah, will be completed. Work will continue at Tuba City, Arizona, and Lakeview, Oregon. Processing site remedial action will be started at Durango, Gunnison and Grand Junction, Colorado; Riverton, Wyoming; Ambrosia Lake, New Mexico; and Mexican Hat, Utah.

SURPLUS FACILITIES MANAGEMENT PROGRAM

This program provides for the safe management and disposition of certain surplus radioactively contaminated DOE-owned facilities from nuclear energy development activities. The decontaminated facilities and sites are to be returned to other productive use, where appropriate. (Similar actions at defense-related facilities are separately budgeted as Atomic Energy Defense Activities.) The facilities are grouped into 35 projects under this activity. This number increases by one for FY 1987 because the Department will assume the responsibility for decommissioning the Power Burst Facility in Idaho, formerly supported by the NRC. A long-range plan was completed in April 1985 to establish the overall schedule and priorities for sites currently in the surplus inventory. Priorities are established and work schedules are developed through analysis of public health and safety, legal, economic, and work continuity factors for each site. The Department's Richland (Washington) Operations Office has the lead role in implementing this program.

In FY 1985, the major onsite cleanup and upgrading of the interim storage cell was continued at the Niagara Falls Storage Site in Lewiston, New York. The remainder of the 4,000 cubic yards of residue stored in a 160-foot tower were transferred through a 3/4-mile pipeline and were excavated from the tower to a low concrete building at the waste storage area. The tower was demolished and the contaminated rubble was moved to the storage cell. A thick clay cap with a design life of greater than 25 years is being placed over the wastes to minimize water infiltration. Installation of this interim cap is scheduled for completion by the end of FY 1986. A Final Environmental Impact Statement (EIS) on the long-term management for this site is to be issued in FY 1986. In FY 1987, only surveillance and maintenance of the Lewiston site is planned. Since all offsite and onsite contamination will have been consolidated into the monitored and controlled storage cell, there will be no urgency from a health viewpoint to proceed with implementation of the long-term management option. This work will be deferred to use available funds for higher priority work.

Work on the decontamination of plutonium-contaminated facilities at the Mound Laboratories (Mound) in Miamisburg, Ohio, will be continued in FY 1986 and FY 1987 and completed in FY 1988. This 11-year project was begun in 1978 and will continue through planned completion as a high priority.

Decommissioning of the Shippingport Atomic Power Station is another major DOE project. Following defueling of the reactor at the end of FY 1984, physical dismantling of the plant began in FY 1985. Preparations for removal of major components were begun, and some noncontaminated buildings were demolished. Dismantling of portions of the plant will continue in

1986 and 1987 and is scheduled to be completed in FY 1990. Preparation for the removal of the reactor pressure vessel will begin in FY 1987; the vessel is scheduled to be barged to the Department's Hanford Reservation near Richland, Washington, for disposal in FY 1989. The Department is cooperating with the NRC and the Electric Power Research Institute (EPRI) in obtaining samples of the pressure vessel for aging studies. Other components will also be examined for this purpose. The Department is participating in an international exchange of decommissioning technology sponsored by the Nuclear Energy Agency, which includes Shippingport, West Valley, and eight significant projects in other member countries.

In FY 1985, the Department continued interim site maintenance and monitoring as well as engineering and planning for the Weldon Spring Site Remedial Action Project in Missouri, a major DOE project. In addition, a Request for Proposals was issued for the remedial action project management contractor and a radiological characterization report for the Weldon Spring Quarry was completed. In 1986, field work for characterization (radiological, chemical and geological) of the Chemical Plant area will be initiated and will continue into FY 1987. Preparation of a draft EIS to be issued in 1986 is underway. The Department's preferred alternative is stabilization of the wastes on site in a disposal cell designed to meet EPA requirements for the stabilization of uranium mill tailings. The project management contractor will be selected and a DOE onsite project office will be established in FY 1986. Conceptual design engineering by the project management contractor will begin in FY 1986 and continue through 1987. The Final EIS and Record of Decision will be issued in FY 1987. Contractors will be mobilized on the site and remedial action will be started in

FY 1987. We estimate that remedial actions at the Weldon Spring site will be completed in FY 1995 and a final report issued by the end of FY 1996.

As previously mentioned, a new project will be added to the SFMP in FY 1987, decommissioning of the Power Burst Facility in Idaho. Current plans are to place the facility into an interim safe storage condition by initiating stabilization and fuel removal to dry storage in FY 1987. The facility is expected to be in a safe storage condition by the fourth quarter of FY 1988 or the first quarter of FY 1989. This condition will minimize surveillance and maintenance costs until funds are available for complete decommissioning, about 1993.

Other activities in FY 1987 will include continuation of site and facility disposition projects at Monticello, Utah; Santa Susana, California; the Argonne National Laboratory (ANL) in Illinois; the Oak Ridge National Laboratory (ORNL) in Tennessee; the Idaho National Engineering Laboratory (INEL) in Idaho; and the Los Alamos National Laboratory (LANL) in New Mexico. Decommissioning of the reactor at the Center for Energy and Environment Research (CEER) in Puerto Rico will begin in FY 1986. At Monticello, Utah, mill tailings will be removed from 12 residential properties, leaving only about 6 properties to be completed in FY 1988. The environmental assessment will be completed for the Monticello mill site in FY 1986 and work on the site will start in FY 1987. Decontamination of surplus facilities at the 350 Area of the ANL-East complex will be completed in FY 1986 and preliminary activities started for the decommissioning of the Experimental Boiling Water Reactor.

WEST VALLEY DEMONSTRATION PROJECT

The objective of the West Valley Demonstration Project is to demonstrate the solidification process for disposal of high-level liquid nuclear wastes under the provisions of Public Law 96-368, the West Valley Demonstration Project Act. An integrated production-scale development and demonstration project for treating high-level liquid nuclear wastes is being carried out at the Western New York Nuclear Service Center, near West Valley.

Major activities being performed as part of this project include: (1) demonstration required to prepare existing facilities and equipment to accommodate the solidification project; (2) removal of wastes from underground storage tanks; (3) development, design, construction, and operation of systems and necessary supporting facilities for the solidification of the wastes; (4) acquisition of containers for the permanent disposal of the solidified waste; (5) temporary storage and transportation of the solidified waste to an appropriate Federal repository for permanent disposal; (6) decontamination and decommissioning of the waste tanks, facilities, hardware, and material used in carrying out the project; and (7) disposal of low-level and transuranic wastes produced from project activities.

As the result of a detailed review, the estimate of total project costs through the waste solidification stage, excluding final decontamination and decommissioning of the facility, was reduced to $442.4 million in year of expenditure dollars. This is a decrease of approximately $30 million from the previous estimate.

Project activities in FY 1985 led to the accomplishment of the most challenging goal of the Project to date, the start of verification testing of major subsystems of the Vitrification System. Individual testing of subsystems was completed in FY 1985 allowing for the start of integrated testing of all major portions of the Vitrification System. Other accomplishments during this period included completion of cleanup of the first of several former reprocessing cells and initial testing of the overall system that will solidify low-level liquid wastes.

During FY 1986, the design of all systems necessary to convert the Component Test Stand into the final shielded Vitrification Facility will be well underway. Radioactive testing in a pilot-scale vitrification system using the West Valley formulation for the high-level waste form will be conducted to support the development of operational procedures for the West Valley Vitrification Facility. The final design of the Supernatant Treatment System to pretreat and reduce the volume of the liquid high-level waste will be completed as well as the civil construction and procurement activities for this system. Installation of equipment for treating low-level liquid wastes before they are solidified in cement will be completed in FY 1986. Decontamination of needed shielded cells will be continued to meet project needs.

In FY 1987, testing of the Vitrification System will concentrate on validation of process control techniques. In parallel, structural aspects of the conversion of the Component Test Stand into the final Vitrification Facility will be completed. The Supernatant Treatment System will be installed and testing completed leading to the start of supernatant processing in mid-FY 1987. The supernate now stored in underground tanks represents nearly 90 percent of the volume and 50 percent of the radioactivity of the stored liquid waste. The separated radioactive material will be stored and later blended with the sludge from the storage tanks and glass formers prior to being fed into the melter in the Vitrification Facility. The Liquid Waste Treatment System will be completed early in the year and used to treat low-level liquid wastes resulting from operation of the Supernatant Treatment System. Decontamination of needed hot cells will continue.

LOW-LEVEL WASTE MANAGEMENT ACTIVITIES

The Low-Level Waste Program provides assistance to States and regions in developing capacities for the disposal of low-level radioactive waste, in accordance with Public Law 99-240, the Low-Level Radioactive Waste Policy Amendments Act of 1985, enacted on January 15, 1986. This legislation has assigned individual States the responsibility for the disposal of low-level wastes generated within their borders, with the exception of waste generated as a result of certain Federal activities and civilian low-level waste exceeding the limits established by the NRC for Class C low-level waste. The formation of regional compacts to carry out this responsibility is encouraged by the Act. The goal of the Department's Low-Level Waste program is to assist States and regions in the development of an effective nationwide low-level waste management system. The Act has also assigned several new responsibilities to the Department in addition to providing assistance to States and compact regions.

During FY 1986, the Low-Level Waste Program will conduct the activities required in the Act and will focus primarily on meeting the generic technical needs of the States and compact regions as they work to select sites and develop new disposal facilities. Specifically, the Department plans to concentrate on assisting States and regions in evaluating alternative disposal technologies to those currently in practice at the currently operating sites in Washington, South Carolina, and Nevada. The program will support the continued correction of problems and stabilization efforts at disposal sites no longer in operation and will continue to provide an evaluation of innovative waste treatment methods to the private sector. DOE expects to finish development of the procedures that will be used to evaluate proposals for transfer of closed low-level waste sites to the Department under Section 151 of the Nuclear Waste Policy Act of 1982.

In FY 1987, the Low-Level Waste Program will continue to provide technical assistance to States and regions to support the selection and development of new low-level disposal facilities; support the correction of problems and stabilization at existing disposal sites; and complete an assessment of advanced, innovative methods for the treatment and disposal of low-level waste. The report identifying options for the Congress on disposing of greater-than-Class C low-level wastes will be completed by January 1987.

WASTE TREATMENT

The goal of the Waste Treatment Program over the past 5 years has been to develop and transfer technologies for the treatment and immobilization of nuclear wastes in forms acceptable for transportation, storage, and disposal. Efforts have been focused on determining the long-term reliability and maintaining the ability of a prototypical high-level waste treatment system, on testing and selecting acceptable high-level waste forms for storage or disposal, and on transferring treatment technologies to specific Departmental waste management programs such as the West Valley Demonstration Project.

In FY 1986 we will complete the second year of our efforts to determine the operational reliability, safety, and process control flexibility of the ceramic melter system for solidification of high-level radioactive wastes and continue collaborative programs with the Federal Republic of Germany and Japan on testing of a radioactive vitrification system.

In FY 1987, radioactive testing of the high-level waste vitrification system at the Pacific Northwest Laboratory will be stopped and this program of research and development will be terminated. Reports on research results obtained in FY 1986 will be completed.

BYPRODUCTS UTILIZATION

In the FY 1986 Energy and Water Development Appropriations Act (Public Law 99-141), Congress provided resources for a civilian byproducts utilization program with a primary emphasis on food irradiation. We have proceeded--in cooperation with States, other Federal agencies, and private sector organizations--to develop plans and designs for establishing agricultural commodity irradiators in States selected on the basis of their needs and proximity to major agricultural production and processing centers. In anticipation of possible widespread use of food processing with irradiation, this program also focuses on developing an adequate U.S. based supply of radiation sources. Funding from the private sector will be sought for completion of these projects in future years, including FY 1987.

URANIUM ENRICHMENT ACTIVITIES

The Department's FY 1987 budget request for the Uranium Enrichment program is approximately $1.05 billion in budget authority, which will be fully offset by $1.29 billion in projected revenues. In addition, DOE proposes to return $235 million to the Treasury as a part of the repayment of prior Government investment in the uranium enrichment enterprise. The funds requested are distributed among the major elements of the program as follows:

	---($ in Millions)---	
Program Element	FY 1986 Estimate	FY 1987 Request
Uranium Enrichment Activities		
Gaseous Diffusion Operations & Support	$1,075.0	$ 992.6
Atomic Vapor Laser Isotope Separation	127.0	50.0
Gas Centrifuge Program Closeout/Activities	344.4	4.0
Program Direction	4.0	4.8
Subtotal	1,550.4	1,051.4
Payback to Treasury	0*	235.0
Total	1,550.4	1,286.4
Uranium Enrichment Revenues	-1,360.6	-1,286.4
Net Appropriation	189.8	0

* Revenues in excess of outlays of approximately $110 million will accrue to the Treasury in FY 1986.

OVERVIEW

The next 2 years will be a key time period for the uranium enrichment enterprise. During this period the program restructuring which began in 1984 will continue. In the last 2 fiscal years, significant progress has been made in redirecting the enterprise to help assure its competitiveness and long-term viability in the international marketplace. Supply and demand have been stabilized by issuing the Utility Services (US) contracts and by very successfully converting existing customers to the new contracts. Having defined the customer demand that must be met through the conversions to the US contracts, the Department then developed appropriate production and R&D strategies to meet that demand and announced those decisions in June 1985.

Through revision of the Uranium Enrichment Services Criteria currently underway, the ground rules under which the enterprise will operate in the future will be refined. The Department will initiate payments to the Treasury in partial recovery of prior unrecovered costs.

A new initiative that will begin in February 1986 will be an effort to transfer future development and ultimate deployment of the AVLIS technology to the private sector. The areas in which the private sector can most beneficially be involved in the enterprise will be defined by the response to a request for expressions of interest that will be issued in February 1986. At a minimum, it is hoped that the private sector will be interested in deploying the AVLIS technology. This advanced method of enriching uranium holds significant technical and economic potential for the United States and should provide the type of challenge in which the private sector has demonstrated its capability to meet. In that light, the Department will initiate later this year an industrial access program to allow qualified U.S. firms to become familiar with the AVLIS technology so that there is an assured industrial base to deploy the technology in the future. DOE is open to other forms of private sector participation in the enterprise, and the Department is prepared to entertain any new proposals in this regard.

We believe the prospects for a bright future for uranium enrichment in the United States continue to improve. It is clear that the changes made the last few years, though painful, were necessary. The enterprise is becoming much more cost competitive in operating the existing gaseous diffusion plants and is continuing the development of the world's most advanced enrichment technology for the future. However, there is more to be done. In FY 1987, the Department looks forward to working closely with Congress to develop the institutional framework that will assure that the Nation continues to have a reliable supply of enrichment services for the long term. We must continue to pursue vigorously a restructuring of the enterprise and the involvement of the private sector to assure that the optimum benefits of the strategy on which we embarked several years ago are achieved. A brief review of the elements of that strategy follows.

OBJECTIVES

The primary objective is to retain a competitive, financially healthy uranium enrichment supply capability in the U.S. for the long term consistent with the Atomic Energy Act, other legal requirements, and the interests of the Nation.

The major goals which have been established for the U.S. uranium enrichment enterprise, as articulated in the June 1985 strategy, include:

- to bring supply and demand of DOE-origin enriched uranium into balance;
- to offer reliable customer services;
- to offer competitive prices;
- to capture uncommitted market consistent with financial interests;
- to minimize the cost of operating existing enrichment plants;
- to retain the U.S. leadership in advanced technology and deploy as appropriate to meet business objectives; and
- to adopt a more businesslike institutional structure.

Important progress has been made toward achieving these goals. A summary of some of the more significant accomplishments during the past 2 years follows.

BRING SUPPLY AND DEMAND INTO BALANCE

The US contracts, introduced in January 1984, were a major step which have enabled the enrichment enterprise to compete more effectively in the international marketplace. They have brought stability to the projected sales base and corresponding revenues. They have permitted DOE customers to reduce enriched and natural uranium inventories, and produced a more orderly market serving the nuclear fuel cycle.

The US contracts were offered in January 1984, and about 90 percent of DOE customers converted to these contracts. Subsequently, representatives of the uranium mining industry brought suit against DOE based on the procedures which were used and the terms of the new contract form.

Litigation concerning the US enrichment contract is proceeding in both the U.S. District Court for the District of Colorado and in the U.S. Court of Appeals for the Tenth Circuit. DOE has noticed its appeal of the judgment of the district court in which the court ruled that the US contract was null and void. No briefing schedule has been established by the court.

OFFER RELIABLE CUSTOMER SERVICES

Reliability of supply is a term we hope will become synonymous with U.S.-supplied enrichment goods and services. We strive continually to offer the world's most reliable enrichment services and to respond quickly to changes in the marketplace. We believe this is a significant factor in utility decisions, both here and abroad, to contract with DOE for their enrichment services.

OFFER COMPETITIVE PRICES

A crucial element of the competitive strategy is the approach to pricing. The market is extremely price sensitive and DOE prices simply must be more competitive. The key to the survival of the U.S. uranium enrichment business is to get near-term prices down into the competitive range by aggressively reducing costs.

The price for US contract holders in 1985 was $135 per separative work unit (SWU). In announcing the June 5, 1985, enrichment program decisions, Secretary Herrington pointed out that maintaining the DOE price at uncompetitive levels was, in effect, a going out of business strategy. On October 1, 1985, a price reduction to $125 per SWU became effective. This price is still higher by 35 to 40 percent than those currently offered by competitors. Accordingly, DOE has announced its plans to continue its price reduction policy by offering a FY 1987 base price of $119 per SWU effective October 1, 1986.

This declining pricing pattern for the U.S. adds credibility to plans for even lower prices in the future. The results of not following a competitive pricing strategy would have serious impact on the enterprise. It is estimated that DOE would lose about $7 billion in revenues between now and the year 2000 if it were to keep prices at the current $125 per SWU level. Thus, our pricing policy is crucial to the competitive strategy.

CAPTURE THE UNCOMMITTED MARKET

During the past year, we have taken strong actions to revitalize this country's uranium enrichment enterprise. Most notably, through several creative marketing initiatives, we were able to increase our share of the free world enrichment market from 46 percent in 1985 to 53 percent in 1990.

In 1985, there remained approximately 7 million SWU's of uncommitted sales opportunities with DOE enrichment customers available from FY 1987 through FY 1990. During this period, DOE has excess production capacity that could produce SWU's at low marginal costs. To allow its customers to benefit from this capability, in April 1985, DOE offered an incentive price of $90 per SWU to customers with uncommitted sales in FY 1987 through FY 1990. This incentive pricing offer proved very successful--nearly 87 percent of

DOE customers with uncommitted requirements accepted the incentive price proposal. As a result, DOE sales for FY 1987 through FY 1990 time period increased by 14 percent, or over 5 million SWU's.

In 1986, we hope to solidify and increase our market share for the period 1991-1995. By April 1, 1986, DOE customers must decide how much of their fuel supply they will take from DOE in FY 1991. Over 25 percent of DOE's US contract enrichment demand is uncommitted from FY 1991 through FY 1995. Total sales opportunities are about 20 million SWU's with a sales value of about $2 billion.

In light of this previously successful pricing effort, DOE has made a FY 1986 incentive pricing offer to its customers. In return for customer commitments to purchase 100 percent of their enrichment requirements from DOE in the 5-year period from FY 1991 to FY 1995, DOE has proposed a price of about $85 per SWU for the remaining 30 percent fraction of their enrichment requirements. Under US contracts, at least 70 percent of the customers' enrichment requirements would be priced at the DOE base price.

If successful, this post-FY 1990 incentive price extension will increase DOE's market and revenues, discourage competitor investment in new capacity, improve U.S. trade balance, prevent competitor penetration of DOE's market share, and effectively utilize excess DOE production capacity. In addition, a larger sales volume to DOE will result in lower unit production costs which could be passed along to all customers in the form of lower prices.

MINIMIZE COSTS OF EXISTING PLANT OPERATIONS

Placing the Oak Ridge Gaseous Diffusion Plant in Standby

Because minimizing the cost of existing plant operations is key to near term DOE price competitiveness, Secretary Herrington decided in June 1985 to place the Oak Ridge (Tennessee) Gaseous Diffusion Plant in standby status at the earliest possible date. This major, near-term cost reduction decision followed extensive analysis that showed that about $250 million could be saved between FY 1986 and FY 1991 by taking that action. The Oak Ridge Gaseous Diffusion Plant has been in standby status since August 1985, and will remain in that condition with the DOE Office of Defense Programs providing the standby funding because of projected defense demands for enriched uranium in the outyears. If the standby funding is not provided, the plant will be shut down permanently. If the plant is premanently shut down, it will not be operable because critical components will no longer be maintained.

Reducing the Cost of Gaseous Diffusion Plant Operations

The costs of operating the Portsmouth and Paducah Gaseous Diffusion Plants (GDP's) were also reduced in FY 1985. New and innovative ways of operation, coupled with the use of lower cost unfirm power which is about 30 percent cheaper than firm power, improved the economics of operating the GDP's. Significant savings have been demonstrated through the use of low-cost evening, weekend, and offpeak seasonal power. It is planned to continue to take advantage of this lower cost, unfirm power to the maximum extent possible in the future.

Gas Centrifuge Enrichment Plant Termination

Another strategically necessary but very difficult cost reduction decision was the termination of the GCEP project. After extensive analyses, the Department concluded that any GCEP completion scenario that required the outlay of significant amounts of additional capital was unjustifiable from an investment point of view. Simply put, the best GCEP scenarios resulted in production costs that were about equal to the production costs of the GDP's that are operating today, and all GCEP scenarios involved greater technical and economic risks than continued GDP operation.

Closeout of all GCEP-related activities is proceeding well and DOE is working diligently to identify alternative uses for the GCEP equipment and facilities as well as other centrifuge facilities throughout the country.

RETAIN U.S. LEADERSHIP IN ADVANCED TECHNOLOGY

The U.S. currently enjoys a commanding lead in developing the world's most advanced enrichment technology, the AVLIS process. We plan to maintain that lead to assure that, even when other countries decide to deploy AVLIS, the U.S. will have a more advanced, lower cost process on line.

The figures of merit that favored the selection of AVLIS over the Advanced Gas Centrifuge for further development clearly showed its greater potential for low cost and reliable production for the future. The AVLIS technology is less capital intensive, requires significantly less investment prior to a decision to deploy, has a lower estimated SWU cost, has greater potential for cost reductions through technology improvements, and is more adaptable to deployment in increments that can match the evolving needs of the enrichment marketplace.

In FY 1985, the one-half scale MARS separator was successfully integrated with the first phase of the Laser Demonstration Facility for enrichment tests. Test results will establish an experience base in the operation of large scale integrated hardware as well as calibrate the consistency between model prediction and measured enrichment performance. The near full scale Materials Handling Demonstration Module was operated continuously for over 100 hours, thereby establishing the initial key segment of materials handling technology for design and operation of a full-scale separator pod.

In FY 1986, these facilities will be used to demonstrate enrichment for extended periods of time and to demonstrate the materials handling capability of this subsystem. Attention will focus on resolution of issues identified by the Process Evaluation Board as being technically critical or having high economic leverage.

Another important initiative undertaken in February 1986 is to take steps to transfer the development and ultimate deployment of the AVLIS technology to the private sector. This initiative is needed to relieve pressure on the annual budget, and to help assure the pace and schedule of the program leading to the construction of the first and any follow-on plants.

DOE is seeking responses from qualified parties describing their desire to fund development and deployment of the AVLIS technology. The Department is willing to provide access to AVLIS technology and, in return, to transfer technical, managerial, and financial responsibility for remaining development and demonstration activities.

DOE will keep Congress informed of the progress made in obtaining private sector participation in the AVLIS program.

REPAYMENT OF OUTSTANDING GOVERNMENT INVESTMENTS

The Government's outstanding investment will be recovered in a manner that will assure that commercial and military customers will continue to obtain competitively priced enrichment services.

The write-off of the equivalent of the unproductive assets will be reflected in DOE's 1985 financial statement. This is consistent with generally accepted accounting practices and the Uranium Enrichment Services Criteria, both existing and proposed. As a result, the level of outstanding Government investment will be reduced from $7.5 billion to $3.5 billion. In addition, interest on this account will be based on the average historical long-term Government borrowing rate. This will have the effect of lowering the imputed interest rate. This approach establishes annual payment goals, and proposes to begin with $110 million in FY 1986 and $235 million in FY 1987.

MODIFICATION OF URANIUM ENRICHMENT SERVICES CRITERIA

One key action recently initiated by DOE is the proposed modification of the Uranium Enrichment Services Criteria. A Notice of Proposed Rulemaking was published in the Federal Register on January 29, 1986. The proposed Criteria modification addresses: (1) items that were questioned in the miners' lawsuit; (2) other aspects of the enterprise, including flexibility for future competitive actions; and (3) reiteration of the Administration's position opposing import restrictions on natural uranium.

Accordingly, the proposed Criteria address two of the issues mentioned in the Subcommittee's invitation letter for this hearing--the requirements of the Atomic Energy Act relevant to enrichment pricing and the domestic uranium industry. The complete text of the proposed rulemaking is attached for inclusion in the hearing record.

We hope to complete the rulemaking process by the end of summer. All interested parties will have an opportunity to comment on the proposed Uranium Enrichment Services Criteria, both in writing and at a public hearing that will be held in Washington, D.C., on March 18-19, 1986.

Subsequent to the review and consideration of public comments, DOE will submit the revised Uranium Enrichment Services Criteria to Congress at least 45 days prior to their actual effective date pursuant to Section 161(v) of the Atomic Energy Act.

NUCLEAR ENERGY RESEARCH AND DEVELOPMENT

Finally, I will comment briefly on three areas of our Light Water Reactor R&D program in which the Subcommittee expressed interest. These are the Three Mile Island (TMI) R&D, Extended Fuel Burnup, and Loss-of-Fluid Test (LOFT) programs.

THREE MILE ISLAND R&D SUPPORT

The objectives of our TMI activities are to develop the technology that will improve the capability of civilian nuclear powerplants to safely recover from accidents and to conduct relevant R&D that will substantially enhance nuclear powerplant safety and operation.

Recent examinations and analyses have indicated that a substantial quantity--up to 20 tons--of core material is in the bottom of the reactor vessel, below the lower grid plate. The current General Public Utilities schedule projects the completion of fuel removal from the original core region by the end of FY 1986 and removal of the remaining fuel from the bottom of the reactor vessel and from primary system components by the end of FY 1987.

Beginning in FY 1986, the damaged core will be collected for shipment to a DOE laboratory for examination and interim storage. During FY 1987, DOE will terminate its onsite activities. Other efforts in FY 1987 will be to conduct the offsite examination of the damaged TMI reactor core at the Idaho National Engineering Laboratory and other laboratories and to transfer the results of our examination to industry. DOE's involvement in this effort will be completed in FY 1988.

EXTENDED FUEL BURNUP PROGRAM

Efforts over the last 10 years on extended fuel burnup have provided benefits to the participating fuel suppliers and utilities. Consistent with Public Law 99-141, DOE has initiated closeout of Federal involvement in this program. During FY 1986, Federal involvement will be completed in

6 of the 11 extended burnup projects. The focus will shift to the fuel suppliers and utilities to build upon these efforts and to state public utility commissions to recognize sufficient economic incentives for longer life fuel.

LOSS-OF-FLUID TEST PROGRAM

Fuel damage testing conducted during prior years culminated in successful completion of the reactor testing portion of the LOFT program in FY 1986. A key task under our Light Water Reactor safety efforts is continuing the severe accident technology program in FY 1987, including post-irradiation examination of the damaged fuel from LOFT and TMI in cooperation with international partners. The focus of our FY 1987 activities will be the performance of various technical analyses, including technical consensus on models and data for LWR's.

The goal is to develop and apply a severe accident methodology incorporating results of all recent experimental work and incorporating an understanding of the ability of operator actions to reduce the consequence of accidents through more informed decisionmaking in the control room. Effective consensus in this area is crucial to regulatory reform and a better understanding of the requirements for emergency preparedness at both the local and Federal level.

Mr. Chairman, this completes my statement. I would be pleased to answer any questions you may have at this time.

ATTACHMENT A:

DEPARTMENT OF ENERGY

10 CFR Part 762

Proposed Uranium Enrichment Services Criteria

AGENCY: Department of Energy.

ACTION: Notice of proposed rulemaking.

SUMMARY: The Department of Energy (DOE) is proposing to modify the criteria under which it provides uranium enrichment services. Under the proposed criteria. DOE would negotiate individual enrichment services contracts in accordance with an overall approach intended to maintain the long-term competitive position of the United States in the world market, while obtaining the recovery of the Government's costs for providing enrichment services. The proposed criteria would provide flexibility concerning price. as well as other terms and conditions. in enrichment services contracts. The proposed criteria would continue the existing policy against restrictions on the enrichment of uranium from foreign countries for domestic use. as well as the existing prohibition against discriminatory pricing.

The proposed criteria are responsive to the realities of today's marketplace and will enable DOE to carry out more effectively its statutory mandate under the Atomic Energy Act of 1954 (AEA) to encourage the development and utilization of atomic energy for peaceful purposes. They are consistent with and supportive of the Department's view that civilian nuclear energy has a key role to play in assuring the Nation's energy security and strength. and that continued prominence in providing enrichment services will further non-proliferation of nuclear weapons capabilities. They reinforce continuing efforts to conduct the Department's enrichment activities in a more businesslike. competitive manner and thus will allow the United States to employ its strengths and assets in the context of the highly competitive marketplace that exists today.

DATE: Written comments must be received by February 28. 1986.

DOE will hold a public hearing on the proposed criteria on March 18-19. 1986 Requests for an opportunity to speak at this hearing must be received by DOE on or before March 4. 1986

ADDRESSES: All comments should be identified as "Comments On Proposed Uranium Enrichment Services Criteria" and submitted to NE-34. Room A-172. GTN. U.S. Department of Energy. Germantown. Maryland 20545

Hearing Location: U.S. Department of Energy. Forrestal Building. DOE Auditorium. Room GE-086. 100 Independence Avenue SW.. Washington. DC 20585.

FOR FURTHER INFORMATION CONTACT:

Ben McRae. Office of General Counsel U.S. Department of Energy. Room 6E-042. 1000 Independence Avenue. SW.. Washington. DC 20585 (202) 252-6667

Lawrence Laiken. Office of General Counsel. U.S. Department of Energy. Room 6B-256. 1000 Independence Avenue. SW.. Washington. DC 20585. (202) 252-6975

John Thereault. Division of Technology Deployment and Strategic Planning. Office of Uranium Enrichment. Room A-172. Germantown. Maryland 20545. (301) 353-4810

SUPPLEMENTARY INFORMATION:

I. Introduction

Under the AEA. DOE is responsible for producing enriched uranium for civilian and defense uses. In this Notice. DOE is proposing to modify the criteria which set forth the terms and conditions under which DOE provides enrichment services for civilian customers.

In developing the proposed criteria. DOE has been mindful of the many objectives set forth in the AEA and the significant role uranium enrichment activities can play in achieving them. These objectives include the peaceful use of atomic energy throughout the world. the encouragement of scientific and industrial progress. and the development of a healthy atomic energy industry, including the mining and milling of uranium. By offering enrichment services to other countries, DOE can help to control the development and flow of nuclear material and guard against the proliferation of nuclear weapons. By offering reliable and reasonably priced enrichment services, DOE can enhance the utilization of atomic energy. And by engaging in the provision of enrichment services, DOE can support scientific and industrial progress. Of course, enrichment services first must serve the paramount objective of ensuring the common defense and security. The attainment of the other goals must be consistent with, and not detrimental to, our national security.

The proposed criteria represent a well-reasoned response to the profound changes that have occurred in the marketplace for enrichment services in the last decade. Originally, the U.S. held a near monopoly on providing enriched uranium. However, during the 1970's, the U.S. lost that position due to a number of factors. Beginning in the mid-1970's competition developed as two European consortia and the Soviet Union began supplying foreign nuclear facilities with enriched uranium. By the 1980's, DOE has become the highest priced primary supplier of enrichment services, charging $138 per separative work unit (SWU)[1] in 1984.[2] As a result, DOE's foreign competitors have captured about 60 percent of the total foreign market and have made significant inroads into the domestic markets.

Prospects for the nuclear power industry in this country also have changed dramatically since the early 1970's because of reduced growth in consumer demand for electricity, combined with higher costs for capital expenditures, construction delays, NRC licensing deferrals and controversy over nuclear power in general. As a result, many nuclear plants were delayed and/or cancelled. Likewise, the nuclear programs of other nations generally have not expanded at the rate formerly anticipated.

By the late 1970's utilities, both foreign and domestic, found themselves committed to long-term contracts for enrichment services they no longer needed. According to DOE estimates, a worldwide surplus of about 30 million SWU's existed by 1984. This in turn, led to the emergence of a secondary market in which utilities have been willing to sell their surplus SWU's to other utilities at discounts of $30 per SWU and more.

As a result of these market changes, DOE found itself in a relatively non-competitive position. DOE's response has been to conduct its enrichment activities in a more businesslike, competitive manner and to develop strategies to employ its strengths and assets. The proposed criteria are intended to reinforce DOE's continuing efforts to provide enrichment services in the context of the highly competitive marketplace that exists today.

II. Background

In order to understand better the proposed criteria, it is necessary to discuss briefly (1) the enrichment process, (2) the statutory framework under which DOE provides enrichment services, and (3) the history of enrichment service criteria.

A. Enrichment Process

Uranium as it occurs in nature contains two principal isotopes: U-235 and U-238. Naturally occurring uranium contains 0.7 percent of the U-235 isotope and 99.3 percent of the U-238 isotope. Only the U-235 isotope can fission, or split apart easily, when bombarded by neutrons. When an isotope fissions, it releases a tremendous amount of heat. As a result, uranium fuel can be used in a nuclear power plant to produce heat, generate steam and drive a turbine to produce electrical power.

Naturally occurring uranium does not contain sufficient U-235 to be used as fuel in nuclear power plants of the type built in the United States. Rather, the U-235 must be concentrated so that it comprises about three percent of the total uranium. The resultant uranium is usually called "enriched uranium." To produce enriched uranium, a very specialized facility called uranium enrichment plant must be used. In such a plant, specially prepared natural uranium (known as "feed material") is processed in a way to increase its content of U-235 and decrease its content of U-238.

The effort that a uranium enrichment plant uses to enrich a quantity of uranium feed material is measured in SWU's. In this process, the feed material is separated into two fractions. The enriched uranium fraction (product) contains a higher concentration of U-235 than the uranium feed material, and the depleted uranium fraction (tails) contains a lower concentration of U-235.

The relative amounts of SWU and natural uranium used to produce a unit of enriched uranium are determined by the amount of U-235 remaining in the depleted tails from the enrichment plant. The fraction of U-235 in the tails is called the "tails assay." A low tails assay requires more SWU and less natural uranium to produce a unit of enriched product. On the other hand, if the tails assay is high, fewer SWU's and more natural uranium is required to produce the same unit of enriched product.

B. Statutory Framework

The Atomic Energy Act of 1946 established a government monopoly over the ownership of all production and utilization facilites and all "special nuclear material" (fissionable material). This monoploy was promulgated in an environment when atomic energy was a relatively new and little understood force, when fissionable materials were scarce, and when the use of atomic energy for the economic generation of electric power was a goal in the distant future.

By 1954, the nuclear environment had changed. American industry had attained substantial experience in the design, construction and operation of nuclear reactors, and the first commercial atomic powered electric generating plant was under construction. With the intention of encouraging the peaceful use of nuclear energy, Congress amended the 1946 Act through the enactment of the Atomic Energy Act of 1954 (AEA). Under the AEA, private industry would, for the first time, own reactors and possess and use fissionable materials in these reactors under license for DOE's predecessor agency, the Atomic Energy Commission (AEC).[3]

In 1964, Congress enacted the Private Ownership of Special Nuclear Materials Act, Pub. L. 88-489, ("1964 Act"), which permitted, for the first time, private ownership of fissionable materials in the United States. The 1954 Act also added Section 161(v) to the AEA, authorizing DOE to "enter into contracts to provide . . . for the producing or enriching of special nuclear material." 42 U.S.C. 2201(v).

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[1] The capacity of plants used for producing enriched uranium is defined in terms of separative work units. Such units measure the amount of effort expended to separate a given amount of natural uranium into two components—one having a higher concentration of fissionable uranium-235.

For a discussion of the enrichment process, see the Background section of this Notice.

[2] In 1984, DOE's competitors were charging $100–115 per SWU.

[3] The Energy Reorganization Act of 1974, Pub. L. No. 93-438, abolished the AEC and created the Energy Research and Development Administration (ERDA) which assumed all but the licensing and regulatory functions of the AEC. The licensing and regulatory functions were vested in the Nuclear Regulatory Commission which was also established by the 1974 Act, while ERDA undertook the military and production activities and the general research activities of the AEC. ERDA became effective on January 19, 1975. ERDA was in turn abolished by the Department of Energy Organization Act, Pub. L. No. 95-91, 42 U.S.C. 7101 et seq., which created the DOE. Section 301(a) of the DOE Act transferred all functions of ERDA to DOE. DOE began operations on October 1, 1977.

In this Notice, the term "DOE" shall be used unless the discussion deals specifically with one of DOE's predecessors.

Section 161(v) requires DOE to establish guidelines, or "criteria," describing how the government would provide private customers with enrichment services. Specifically, Section 161(v) of the 1954 Act provides that:

> [DOE] shall establish criteria in writing setting forth the terms and conditions under which [uranium enrichment] services . . . shall be made available.

These criteria must be submitted to the appropriate Congressional committees, originally the Joint Committee on Atomic Energy (JCAE)[4], for a period of 45 days prior to the time DOE actually establishes the criteria. Section 161(v) also provides that prices for enrichment services "shall be established on a nondiscriminatory basis" and that DOE restrict the enrichment of uranium from foreign countries for domestic use "to the extent necessary to assure [the] maintenance of a viable domestic uranium industry."

As originally adopted, section 161(v) provided that prices for enrichment services be established on a basis which would result in "reasonable compensation to the Government." The JCAE Report on the 1964 Act expressed the Committee's awareness that it might not always be practicable for enrichment services prices to recover costs fully. It concluded that, in establishing prices, "[DOE] will have to consider not only the Government's costs in providing enrichment services but also the national interest in the development and utilization of nuclear power."[5] S. Rep. No. 1325, 88th Cong., 2nd Sess., reprinted in 1964 U.S. Code Cong. & Ad. News, 3105, 3121–3122.

In response to an AEC proposal to establish prices on the basis of hypothetical prices in a non-existent domestic commercial enrichment industry, Congress adopted the current version of section 161(v) which provides that prices for enrichment services "shall be on a basis of recovery of the Government's costs over a reasonable period of time." Pub. L. 91-560, Sec. 8 ("1970 Amendment"). The 1970 Amendment expressed Congressional misgivings over the establishment of enrichment prices significantly higher than the Government's actual costs which, at best, gave minimal consideration to the other objectives of the AEA. The JCAE Report on the 1970 Amendment emphasizes the change was a clarification to implement the intent of Congress when it originally enacted section 161(v) and thus preserved DOE's considerable flexibility to determine the most effective means to recover the Government's costs and carry out its responsibilities under the AEA. (H. Rep. No. 91-1470, 91st Cong., 2nd Sess., reprinted in 1970 U.S. Code Cong. & Ad. News, 4981, 5002–5003, 5012.)

C. History of Uranium Enrichment Criteria

On December 23, 1966, pursuant to Section 161(v), following review by the JCAE, the AEC established the Uranium Enrichment Services Criteria ("criteria"). These criteria set forth the terms and conditions applicable to the sale of uranium enrichment services, including the use of two standard types of contracts: (1) Firm Quantities and (2) Customer's Requirements, or a combination of the two. (31 FR 16479, Dec. 23, 1966). The criteria also provided for delivery schedules, chemical form and specifications of material, charges for enrichment services, a ceiling price, termination provisions, delivery of materials, changes in charges and specifications, and a restriction on the enrichment of foreign uranium for use in domestic reactors.

In 1970, the AEC proposed a change in the basis for computing the price for enrichment services (35 FR 13866). The proposed change never became effective because, as discussed previously, Congress determined the change would permit a pricing increase which wholly disregarded the Government's actual costs and thus violate the intent of the 1954 Act. As a result of this proposed change, Congress enacted the 1970 Amendment. On March 9, 1971, the AEC adopted criteria consistent with the 1970 Amendment (36 FR 4342).

On August 23, 1973, the AEC published revised criteria (38 FR 12180). The modification prescribed the fixed commitment contract as the primary contracting vehicle in order to provide greater assurance that new enrichment capacity would be available in the 1980's on a timely basis. The revised criteria also deleted the requirement of a ceiling price.

On October 25, 1974, the criteria were revised to phase out restrictions on the amount of natural uranium of foreign origin which could be enriched for use in domestic reactors (39 FR 38016). The amount of foreign origin material allowed in 1977 was 10 percent and, under the schedule adopted in 1974, was allowed to grow to 60 percent in 1983; thereafter, no restrictions were to be applied.

On June 27, 1978, the criteria were revised once again to permit DOE to use authorized plant capacity as a basis for offering to provide enrichment services (43 FR 27860). There was also a change to establish the variable tails assay option.

On May 17, 1979, the current version of the criteria was published in the *Federal Register* (44 FR 28875). The only substantive change was the inclusion of imputed interest on the cost of natural uranium contained in inventories at DOE enrichment plants as a cost to be recovered in the charge for enrichment services. In addition, "Department of Energy" was substituted for "Atomic Energy Commission" where appropriate.

III. Proposed Criteria

In early 1984, DOE announced a major initiative to restore the competitive position of the United States in the world enrichment market in order to maintain DOE's role as a provider of enrichment services. The elements of the Department's initiative were: to stabilize DOE's market share through the offering of new more competitive enrichment contracts[6]; to reduce prices; to enhance DOE customer services and marketing activities; and to reduce program costs in all major areas, including diffusion operations and advanced technology research and development activities.

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[4] The Joint Committee on Atomic Energy provided oversight of AEC activities until it was abolished pursuant to Pub. L. 95-110 in 1977. Its functions, including the review of uranium enrichment criteria, have been assigned to other committees of the House and Senate.

[5] DOE is aware that the General Accounting Office (GAO) believes this language applies only to the situation that existed during the period from 1964 through the early 1970's when the emphasis of U.S. enrichment activities was shifting from military to civilian objectives. DOE believes GAO has read the intent of Congress too narrowly. The JCAE Report made clear that the basis for establishing prices under section 161(v) "is flexible." S. Rep. No. 1325, 88th Cong., 2nd Sess., reprinted in 1964 U.S. Code Cong. & Ad. News 3105, 3122. While the JCAE Report indicated this flexibility would permit the AEC to deal with the problems encountered in the shift from military to civilian operations, it did not indicate that the flexibility was intended for that problem alone. DOE believes that if Congress had intended to limit this flexibility as narrowly as GAO contends, it would have included specific language to that effect in section 161(v). By not limiting DOE's flexibility to specific situations, Congress granted DOE considerable discretion to determine, in the first instance, the best pricing approach and which costs are appropriate for recovery in an ever changing environment.

[6] Several groups have challenged these contracts as violating the existing criteria. DOE disagrees and is involved currently in litigation over the validity of these contracts. DOE believes the contracts resulted from a proper reading of the existing criteria in light of the circumstances existing when the contracts were entered into.

The existing criteria may not comprise the best basis for the approaches which DOE may have to take to carry out its mission under the AEA. DOE believes it is appropriate to propose criteria which interpret and apply the requirements of the AEA in light of today's market.

In the following section, DOE discusses the provisions of the proposed criteria. Where appropriate, DOE discusses how the proposed criteria differ from the existing criteria and why this change is proper in light of current conditions and statutory requirements.

"*General.*" Paragraph a sets forth the statutory basis for the criteria. Paragraph b specifies those customers to which DOE can provide enrichment services. These customers are (1) licensees under section 53, 63, 103, or 104 of the AEA and (2) persons covered by cooperative agreements. The Paragraph restates the statutory requirement that persons covered by cooperative agreements can obtain enrichment services only while comparable services are available to licensees under Section 53, 63, 103, or 104 and can obtain such services at prices no less than the prices charged licensees. Paragraph c provides that DOE can not enter into contracts in excess of its available capacity. Paragraph d provides that the criteria, unless specificaly stated, do not affect DOE's ability to sell, lease, or barter special nuclear material. Paragraph e states that the criteria are subject to change and that any change shall be made pursuant to applicable administrative procedures and after submission to Congress.

"*Definitions.*" This section sets forth the definition of several technical terms used in the criteria, such as "enrichment services" and "separative work unit (SWU)."

"*Enrichment of Uranium of Foreign Origin.*" This section continues the current policy of not imposing restrictions on enriching feed material of foreign origin destined for domestic use. It adds a new requirement that a domestic customer must certify the country of origin of feed material delivered to DOE. DOE believes this identification requirement will enhance its ability to monitor the effects of foreign uranium on the domestic mining and milling industry.

Section 161(v) provides that DOE, "to the extent necessary to assure the maintenance of a viable domestic uranium industry, shall not offer . . . [enrichment] services for source or special nuclear material of foreign origin intended for use in a utilization facility within or under the jurisdiction of the U.S." On September 28, 1985, the Secretary of Energy issued a determination pursuant to Section 170B of the AEA that the domestic uranium mining and milling industry was not viable in calendar year 1984. DOE does not believe this determination, standing alone, either authorizes or requires imposing restrictions on the enrichment of feed material of foreign origin under section 161(v) of the AEA. Instead, it indicates that DOE should continue its analysis by considering, in the words of the statute, "the extent" to which restricting enrichment of foreign source material for domestic end use will, in fact, "assure the maintenance of a viable domestic uranium industry." DOE's preliminary view is that restrictions would not assist the domestic mining and milling industry in any meaningful way.

Import restrictions on foreign uranium would not assure the viability of the domestic mining and milling industry. The difficulties currently facing the domestic mining and milling industry appear to stem from various factors, including the disparity between the production cost of domestic and foreign uranium, shrinkage in the demand for nuclear power, excess uranium inventories, excess production capacity, and cancellation of powerplants due to cost overruns and licensing delays.

Import restrictions would have no long term positive effect on the consumption of domestic uranium. As long as DOE's enrichment services costs are competitive with foreign services, customers will procure either domestic or foreign uranium for feed material based solely on economic considerations.[7] They will seek enrichment services from the cheapest source and use the cheapest uranium, foreign or domestic. In the short-term, an import ban might increase consumption of domestic uranium temporarily since existing DOE customers would weigh the costs of terminating their contracts against the comparative prices of domestic and foreign uranium. The costs of terminating contracts would, in effect, subsidize some higher priced domestic uranium. This effect would be temporary and could not assure the long-term viability of the domestic industry.

Import restrictions would have undesirable effects on both the U.S. uranium industry and the DOE enrichment business. A sweeping limitation likely would cause many of DOE's customers to reconsider their enrichment contracts with DOE. Many of these customers currently may be paying a premium for the reliability they expect from dealing with the U.S. Government. The uncertainty about the future operation of the U.S. enrichment program engendered by an import embargo would diminish their willingness to pay such a premium and thus increase the likelihood they might seek enrichment services from abroad. Information available to DOE suggests that for a uranium price difference of as little as ten dollars per pound, a U.S. utility could cancel its DOE enrichment contract, pay the termination fee, buy enrichment services overseas, and save money. Lost sales resulting from such terminations could reach at least $300 million annually by 1988. Losses of this magnitude would force DOE to further curtail operations at its enrichment plants, increasing the unit cost of production.

These developments would be detrimental to the U.S. mining and milling industry. Most domestic DOE enrichment customers currently obtain a large percentage or all of their uranium requirements from domestic sources whereas the customers of DOE's competitors almost invariably use foreign ore. If DOE customers were to terminate their contracts in favor of overseas enrichers, they might obtain all of their natural uranium from foreign producers who offer attractively priced package deals. Thus, the loss of enrichment sales to domestic utilities by DOE could further damage the U.S. mining industry.

While DOE does not believe restrictions to be appropriate at this time, it has taken steps to help the domestic uranium mining and milling industry, including offering a limited free variable tails option and requesting an examination of the issues by the United States Trade Representative. Specifically, the Secretary formally requested the Trade Representative to undertake an examination of imports of uranium to ascertain the appropriate available courses of action under the U.S. trade laws with respect to importation of source material or special nuclear material. In his letter to the Trade Representative, the Secretary expressed his belief that examination of trade matters in the first instance by those familiar with the issues was preferable to an independent finding of injury by DOE under Section 170B which automatically would trigger an investigation under Section 201 of the Trade Act of 1974.

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[7] If DOE's enrichment services were priced less than those of its foreign competitors, then restrictions on imports could increase consumption of domestic uranium since customers would be willing to pay a premium for domestic uranium in order to obtain enrichment services from DOE. In today's competitive market, however, it is unlikely DOE will underprice its competitors sufficiently to make it economical to pay a premium for domestic uranium.

In his December 20, 1985 response, the Trade Representative stated that

> action under the U.S. trade statutes does not appear to be appropriate in regard to both the short and long-term problems facing the domestic uranium mining and milling industry. Moreover, any remedy granted under existing law which might provide the extent of relief requested by the industry would only be short term, while at the same time having an adverse impact on our trade and other relations with important trading partners without resolving the long-term problems of the industry.

The Trade Representative found the principal cause of the problems in the domestic mining and milling industry to be the failure of anticipated demand to materialize and the resultant excess inventory. The response did not recommend import restrictions under section 161(v) of the AEA, and found the major consequence of any such restrictions "would be the shift of enrichment activity from U.S. government facilities to foreign facilities, thereby eroding the position of U.S. enrichment enterprises."

DOE believes its actions concerning the domestic mining and milling industry are entirely consistent with, and supportive of, Congressional intent. In 1982, Congress considered and specifically rejected legislation to require mandatory restrictions on importation of foreign origin uranium. A proposed amendment to the Nuclear Regulatory Commission Authorization Act would have required the Nuclear Regulatory Commission (NRC) to issue criteria restricting the importation of source material and special nuclear material.[6] 128 Cong. Rec. S. [illegible]–2870 (daily ed. Mar. 30, 1982). The conference committee rejected this amendment and reported a bill which contained a provision to require the Secretary, when foreign uranium imports reached a level of 37.5 percent, to revise DOE's enrichment criteria "so as to encourage the use of domestic origin uranium in domestic nuclear powerplants." 128 Cong. Rec. S. 13064 (daily ed. Oct. 1, 1982) (remarks of Senator Domenici); *see also*, 128 Cong. Rec. H. 8803 (daily ed. Dec. 2, 1982) (remarks of Rep. Udall and Rep. Lujan). This provision, however, was rejected by the House of Representatives. *Id.* at H. 8809, and a substitute provision was agreed to by both Houses. 128 Cong. Rec. S. 15316 (daily ed. Dec. 16, 1982). In the substitute measure, section 170B of the AEA (codified at 42 U.S.C. 2210(b)), Congress deleted all references to mandatory import restrictions and, instead, provided for, *inter alia*, (1) the annual viability determination by the Secretary, (2) the possibility of an investigation under section 201 of the Trade Act, and (3) the Secretary to request the Secretary of Commerce to initiate an investigation pursuant to 19 U.S.C. 1862 if uranium imports from executed contracts or options are projected at a level of 37.5 percent for a consecutive two-year period.

"Prices." This section describes the approach DOE will follow in establishing prices for providing enrichment services. As discussed previously, the AEA does not mandate any particular form of pricing. Rather, it grants DOE considerable flexibility to determine what prices best achieve the objectives of the AEA, including recovery of the Government's costs over a reasonable period of time.

DOE believes today's highly competitive marketplace calls for a pricing approach which can respond to the challenge from abroad. Therefore, the proposed criteria make clear DOE's flexibility to respond to changing market conditions by negotiating the price in each contract. DOE will negotiate prices in accordance with an overall approach intended to maintain its long-term competitive position. DOE believes pursuing such an approach is the best way to maximize revenues and thus to recover the Government's costs over a reasonable period of time, as well as to fulfill its other responsibilities under the AEA. Such an approach will permit DOE to pursue a vigorous program to regain market share, increase its revenue, and assure to a higher degree the recovery of the Government's costs.

Under the proposed criteria, there is no fixed price or pricing mechanism which must be used in each and every contract. Thus, as under the existing criteria, an individual contract could include a ceiling price above which the contract price could not rise. Or the price could be indexed to market conditions.

DOE does not believe the reference to "recovery of the Government's costs over a reasonable period of time" mandates a pricing mechanism which explicitly calculates the price in each contract solely on the basis of certain specified costs. The accounting concept of allocating specific costs to particular prices is not synonymous with the statutory concept of recovery of costs over a reasonable period of time. Compliance with the statutory mandate can be judged only by looking at the overall performance of DOE's enrichment activities over a period of time, taking into account the many objectives of the AEA.

In the past, DOE did determine the price per SWU by dividing projected demand over the next ten years into the sum of certain specified costs. Such utility-type pricing was appropriate when the U.S. held a monopoly over enrichment services. However, it is not mandated by either the AEA or the existing criteria and, in today's competitive market, is not well suited to the recovery of the Government's costs over a reasonable period of time. Use of a mechanical accounting formula in today's market would result in further erosion of DOE's market share of enrichment services and prolong the period over which the Government's costs are recovered, if ever.

"Costs." A primary objective of DOE's enrichment activities is the recovery of appropriate Government costs to the extent they reasonably relate to providing enrichment services to civilian customers. In order to permit DOE and Congress, as well as other interested parties, an opportunity to appraise the extent to which DOE is establishing charges for enrichment services which recover appropriate Government costs over a reasonable period of time, the proposed criteria list all costs arguably related to the provision of civilian enrichment services. These costs include expenses incurred in providing enrichment services to civilian customers, as follows:

(1) Electric power and all other costs, direct and indirect, of operating the enrichment plants; (2) depreciation of enrichment plants; (3) costs of process development; (4) costs of DOE administration and other Government support functions; and (5) imputed interest on investment in plant, working capital, the natural uranium contained in those inventories at the DOE enrichment plants needed to provide enrichment services, and the separative work costs of preproduced inventories.

The costs specified in the proposed criteria essentially repeat the costs which appear in the existing criteria. These costs reflect DOE's belief that civilian customers should pay a price which reflects only the actual costs of providing enrichment services. The costs of items which are not, and most likely will not, be used in providing enrichment services to current civilian customers are not appropriate for consideration in determining the exent to which Government's costs are recovered over a reasonable period of time. In this regard, DOE has determined that none of the costs of the Gas Centrifuge Plants and only forty percent of the costs of the Gaseous Diffusion Plants are used to provide enrichment services to civilian customers. Accordingly, only these latter costs are appropriate for determining the extent to which the Government's costs are recovered over a reasonable period of time.

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[6] The AEA permits denial of a license for the importation of natural uranium only when, in the opinion of the NRC, the import would be inimical to the common defense and security or the health and safety of the public. 42 U.S.C. [illegible].

"Recovery of Prior Government Costs." DOE is committed to the recovery of appropriate Government costs over a reasonable period of time. To assist in the attainment of this objective, the proposed criteria set forth in section 762.6 a mechanism for the recovery of prior Government costs. This mechanism would establish reserves sufficient to return to the U.S. Treasury, over a reasonable period of time, previously unrecouped and unrecovered costs associated with the provision of enrichment services to civilian customers.

Under this mechanism, DOE proposes to repay the U.S. Treasury, over a reasonable period of time, $3.457 million of the $7.522 million in prior unrecovered Government costs remaining as of September 30, 1985. The reduction of $4.066 million in the amount to be recovered is the equivalent of writing off plant capacity that will not be used in current or future enrichment operations. Interest will be added to the amount to be recovered by applying to the average annual outstanding balance an interest rate of 8.319 percent, the weighted average of Treasury interest rates applicable in the years in which net increases in Government costs occurred.

Repayments to the Treasury will be made annually. From fiscal years 1987–1991, the amount of the annual repayment is expected to be a $150 million minimum plus a percentage of gross commercial revenues—eight percent in 1987 and eleven percent thereafter. Beyond fiscal year 1991, the annual repayment is expected to be the $150 million minimum plus half the savings from projected decreases in TVA demand charges for electricity.

"Non-discrimination." DOE believes section 161(v) requires all customers to be afforded an opportunity to strike a bargain equal in attractiveness to those available to other customers. Accordingly, the proposed criteria provide that DOE shall negotiate price, as well as other terms and conditions of a contract, on a non-discriminatory basis. The section defines non-discrimination to be the availability of the same prices, terms, and conditions to all similarly situated customers.

"Amendment of Contract." This section continues the policy of the existing criteria to permit contract amendment without penalty. This section also makes clear that contracts can provide for renegotiation at specified times or upon notice by either party. DOE believes the ability to amend and renegotiate contracts is a very important element of maintaining competitive viability.

"Termination by DOE." This section continues the policy of the existing criteria.

"Termination by Customer." This section makes clear the charge to a customer for terminating a contract shall be the subject of negotiation between DOE and the customer and, unlike the termination charges in existing contracts, need not be based exclusively on costs. DOE believes termination charges should assist it in retaining customers. Termination charges should give customers an incentive to continue or, at least, to renegotiate their existing contract, rather than seek a new contract with a new supplier.

"Quantities of Feed and Product Material." This section continues the policy of the existing criteria. Under this section, DOE can continue to offer customers the variable tails assay option which can reduce their costs. This section also makes clear that the criteria only relate to how DOE offers enrichment services and not to how it runs its plants. Specifically, it provides that the criteria do not affect DOE's ability to reduce its operating costs by pursuing a policy of split tails or of using preproduced inventory.

"Customers Option to Acquire Tails Material." This section continues the policy in the existing criteria.

"Responsibility for Materials Meeting Specifications." This section continues the policy in the existing criteria.

"Other Terms." This section makes clear that a contract can contain terms and conditions not specified in the criteria. No prohibition against a term or condition is intended by its non-inclusion in the proposed criteria. For example, the existing criteria provide for advanced payments, while the proposed criteria do not mention advanced payments. After the adoption of the proposed criteria, DOE and its customers will be free to negotiate advanced payments, even though the proposed criteria do not address advanced payments explicitly. The terms and conditions in a contract, however, cannot be inconsistent with the criteria.

"Prior Contracts." This section makes clear that the adoption of the new criteria does not invalidate any prior contract. All contracts under which DOE has been providing enrichment shall continue to be effective after the adoption of these criteria. However, prior contracts can be amended to conform to the new criteria without penalty, if both parties agree.

IV. Public Comment Procedures

A. Written Comments

You are invited to participate in this proceeding by submitting data, views or arguments with respect to the issues set forth in this notice. All comments should be submitted by 4:30 p.m., e.s.t., of the day specified in the "DATES" section to the address indicated in the "ADDRESS" section of this preamble and should be identified on the outside envelope and on documents submitted with the designation "Comments on Proposed Uranium Enrichment Criteria." Ten copies should be submitted. All comments received by DOE will be available for public inspection in the DOE Freedom of Information Office, Room 1E-190, Forrestal Building, 1000 Independence Avenue S.W., Washington, D.C. between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday, except Federal holidays.

Any information on data submitted which you consider to be confidential must be so identified and submitted in writing, one copy only. We reserve the right to determine the confidential status of the information or data and to treat it according to our determination.

B. Public Hearing

1. *Procedure for requests to make oral presentations.* Requests to speak should be in writing and contain a telephone number where you may be contacted during the day prior to the hearing. Request must be submitted to the address indicated in the "ADDRESS" section of this preamble and received by DOE by 4:30 p.m., e.s.t., on March 4, 1986.

If you are selected to be heard at the hearing, we will notify you before the date of the hearing. You will be required to submit 50 copies of your statement to DOE prior to the date of the hearing.

2. *Conduct of the hearing.* We reserve the right to select the persons to be heard at the hearing (in the event there are more requests to be heard than time allows), to schedule their respective presentations, and to establish the procedures governing the conduct of the hearing. The length of each presentation

may be limited, based upon the number of persons requesting to be heard.

A DOE official will be designated to preside at the hearing. This will not be a judicial-type hearing. Questions may be asked only by those conducting the hearing. At the conclusion of all initial oral statements, each person who has made an oral statement will be given the opportunity, if he or she so desires, to make a rebuttal statement. The rebuttal statements will be given in the order in which the initial statements were made and will be subject to time limitations.

If you wish to ask a question at the hearing, you may submit the question, in writing, to the presiding officer. The presiding officer will determine whether the question is relevant, and whether time limitations permit it to be presented for answer.

Any further procedural rules needed for the proper conduct of the hearing will be announced by the presiding officer.

A transcript of the hearing will be made. The entire record of the hearing, including the transcript, will be retained by the DOE and made available for inspection in the DOE Freedom of Information Office, Room 1E-190, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC, between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday, except Federal holidays. You may purchase a copy of the transcript from the reporter.

V. Procedural Matters

A. Executive Order 12291

Executive Order 12291 (46 FR 13193, February 19, 1981), requires an agency to prepare a regulatory impact analysis for any proposed major rule. DOE has determined that this proposal does not constitute a "major rule," as defined in the Executive Order, because: (1) The proposed criteria will not directly result in the level of impact necessary to meet the definition of a "major rule"; and (2) in keeping with the purpose and intents of the Executive Order, the proposed criteria will not increase the regulatory burdens on American society.

B. Atomic Energy Act

Under Section 161(v) of the Atomic Energy Act, 42 U.S.C. 2201 (v), DOE must submit criteria to the appropriate Congressional committees for a period of forth-five days prior to the time DOE actually establishes the criteria. Pursuant to this requirement, DOE will submit the criteria which it decides to adopt to the proper committees at least forty-five days prior to their actual effective date.

C. National Environmental Policy Act

In accordance with the regulations of the Council of Environmental Quality (40 CFR Parts 1500–1508) implementing the National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321 *et seq.*, DOE prepared an Environmental Assessment (EA) on the proposed revision to the criteria. Based upon this EA, DOE issued a Finding of No Significant Impact (FONSI) concluding that the proposed revision to the criteria is not a major federal action significantly affecting the quality of the human environment. This FONSI is being published as an appendix to this Notice.

D. Regulatory Flexibility Act

Pursuant to Section 605(b) of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, DOE certifies that the proposal will not have a significant economic impact on a substantial number of small entities because: (1) The proposed criteria will not directly result in the level of impact required to meet the standard set forth in the Regulatory Flexibility Act; (2) to the extent the proposed criteria may have any direct impact, such impact will not be adverse to small entities; and (3) the number of small entities that may be affected by the proposed criteria is not large enough to meet the standard set forth in the Regulatory Flexibility Act.

E. Paperwork Reduction Act

The proposed criteria do not directly provide for the collection of information. The contracts that will be based on the criteria will be used to collect certain information, and at the appropriate time DOE will submit the collection of information requests contained in the contracts to the Office of Management and Budget for approval in accordance with the Paperwork Reduction Act of 1980, 44 U.S.C. 3501.1 *et seq.*, and the procedures implementing that Act, 5 CFR 1320.1 *et seq.*

List of Subjects in 10 CFR Part 782

Uranium.

For the reasons set out in the preamble, Chapter III of Title 10 of the Code of Federal Regulations is proposed to be amended as follows.

Issued in Washington, DC, on January 24, 1986.

James W. Vaughan, Jr.,

Acting Assistant Secretary for Nuclear Energy.

1. Chapter III of Title 10 is amended by adding a new Part 782 to read as follows:

PART 782—URANIUM ENRICHMENT SERVICES CRITERIA

Sec.

782.1 General
782.2 Definitions
782.3 Enrichment of Uranium of Foreign Origin
782.4 Prices
782.5 Costs
782.6 Recovery of Prior Unrecouped Government Costs
782.7 Non-discrimination
782.8 Amendment of Contract
782.9 Termination by DOE
782.10 Termination by Customer
782.11 Quantities of Feed and Product Material
782.12 Customer's Option to Acquire Tails Material
782.13 Responsibility for Material Meeting Specifications
782.14 Other Terms
782.15 Prior Contracts

Authority: Sec. 161(u), Atomic Energy Act of 1954, 68 Stat. 921 (42 U.S.C. § 2201(u)).

§ 782.1 General.

(a) *Authority.* These criteria set forth the general terms and conditions applicable to the provision of uranium enrichment services in facilities owned by DOE, as authorized by the Atomic Energy Act of 1954, as amended (the Act). Specifically, these criteria are established pursuant to section 161(v) of the Act, which was added by Pub. L. 88–489, the "Private Ownership of Special Nuclear Materials Act."

(b) *Eligible customers.* DOE may enter into contracts for providing enrichment services with licensees and cooperative agreement customers. Enrichment services can be offered to cooperative agreement customers only while comparable services are available to licensees and cannot be offered for prices less than the prices for services to licensees.

(c) *Capacity limitations.* DOE will not enter into contracts in excess of the available capabilities of DOE. Available capability consists of inventories of material available or committed to DOE and the physical capability of existing and authorized enrichment plants, fully powered and operated without limitation as to mode of operation, but as reduced by potential commitments involving forecasts of Government needs.

(d) *Sale limitations.* Except as specifically provided, nothing in this notice shall be deemed to affect the sale or leasing of special nuclear material by DOE or the entering into "barter" arrangements whereby special nuclear material is distributed pursuant to Section 54 of the Act and source material is accepted in part payment therefore.

(e) *Revision of criteria.* The criteria contained in this notice are subject to change by DOE from time to time; however, any such changes shall be developed in conformance with applicable administrative guidelines and shall be submitted to the Committees of the Senate and House of Representatives which under the rules of the Senate and House have jurisdiction for review in accordance with the Act.

§ 762.2 Definitions.

(a) "Enrichment services" means the separative work necessary to enrich or further enrich uranium in the isotope U-235.

(b) "Cooperative agreement customer" means a person receiving enrichment services pursuant to an agreement for cooperation arranged pursuant to section 123 of the AEA.

(c) "Licensee" means a person licensed under sections 53, 63, 103 or 104 of the AEA.

(d) "Separative work" means the measure of the effort required to separate a quantity of uranium feed material into (1) an enriched fraction containing a higher concentration of U-235 than the feed material and (2) a tails fraction containing a lower concentration of U-235.

§ 762.3 Enrichment of uranium of foreign origin.

A domestic customer shall certify the country of origin of feed material delivered to DOE.

§ 762.4 Prices.

DOE shall negotiate prices in individual enrichment services contracts in accordance with an overall approach intended to maintain the long-term competitive position of DOE while obtaining the recovery of the Government's costs over a reasonable period of time.

§ 762.5 Costs.

DOE will establish charges for enrichment services on a basis that recovers appropriate Government costs over a reasonable period of time. Such costs will be determined on a basis that includes the costs incurred in providing enrichment services to civilian customers, as follows:

(a) Electric power and all other costs, direct and indirect, of operating the enrichment plants;

(b) Depreciation of enrichment plants;

(c) Costs of process development;

(d) Cost of DOE administration and other Government functions in support of the Enrichment Program; and

(e) Imputed interest on investment in plant, working capital, the natural uranium contained in those inventories at the DOE enrichment plants needed to provide enrichment services, and the separative work costs of preproduced inventories.

§ 762.6 Recovery of prior unrecouped Government costs.

In establishing prices for providing enrichment services for civilian customers DOE will establish reserves sufficient to return to the Treasury of the United States, over a reasonable period of time, previously unrecouped and unrecovered costs associated with provision of enrichment services to civilian customers. The estimate of such costs will include costs attributable to plant capacity used to provide enrichment services for civilian customers, but will not necessarily include costs attributable to plant capacity or other investments not properly allocable to the Government's costs associated with providing enrichment services to civilian customers.

§ 762.7 Non-discrimination.

The same prices, as well as other terms and conditions, shall be available to all similarly-situated customers on a non-discriminatory basis, reflecting the cost of the enrichment services supplied to those customers.

§ 762.8 Amendment of contract.

At the request of either DOE or the customer, the parties will negotiate and, to the extent mutually agreed, amend the contract without additional consideration. A contract may provide for renegotiation of prices, as well as other terms and conditions, at specified times or upon request by either party.

§ 762.9 Termination by DOE.

(a) The contract may be terminated by DOE without cost to DOE upon reasonable notice at such time as commercial enrichment services are provided by another domestic source: *Provided, however,* that DOE will upon request by the customer rescind any notice of termination and will continue to furnish the services specified in the contract if the services of the domestic source are not available to the customer: (1) to the extent provided for in the DOE contract during the remainder of its terms, and (2) on terms and conditions, including charges, which are considered by the DOE to be reasonable and nondiscriminatory.

(b) DOE may terminate the contract without cost to DOE in the event the customer loses its right to possess enriched uranium, or defaults on its contractual obligations, or becomes involved in bankruptcy proceedings. In such instances, the customer will be required to pay a termination charge determined as if the customer had terminated the contract.

§ 762.10 Termination by customer.

The contract shall provide the circumstances under which the customer may terminate the contract in whole or in part. Reasonable and appropriate charges for termination as are negotiated shall be specified in the contract.

§ 762.11 Quantities of feed and product material.

The quantity of material to be furnished by the customer in relationship to the quantity of enriched uranium to be delivered by DOE and the related amount of separative work to be performed by DOE normally will be determined in accordance with the then current standard table of enriching services published by DOE. DOE may agree to perform such services in accordance with such other table as is within its capability. DOE will not necessarily use the specific feed material or quantity of material furnished by the customer in producing the enriched uranium delivered to the customer.

§ 762.12 Customer's option to acquire tails material.

The customer shall be granted an option to acquire tails material (depleted uranium) resulting from the performance of enrichment services. The option as to quantity (kg U) of tails material desired by the customer, within the maximum quantity subject to the option, must be exercised at the time of delivery of the related quantity of feed material. The U-235 assay of the tails material delivered to the customer will be within the sole discretion of DOE. The maximum quantity of depleted uranium subject to the option will be equal to the difference between the total uranium supplied by the customer as feed material and the total enriched uranium furnished to the customer, less processing losses as established from time to time by DOE. Delivery of tails material will normally be at the same time as delivery of enriched uranium.

§ 762.13 Responsibility for materials meeting specifications.

The customer warrants that all feed material meets specifications and, with stated exceptions, agrees to hold DOE and its representatives harmless from all damages, liabilities, or costs arising out of a breach of the warranty where such damages, liabilities, or costs are incurred prior to final acceptance of the feed material by DOE. However, the customer is not deprived of any rights under indemnification agreements entered into pursuant to section 170 of the Act (Price-Anderson indemnification). DOE's obligation to furnish specification material to the customer terminates upon final acceptance of such material by the customer.

§ 762.14 Other terms.

A contract may contain terms and conditions not specified in these criteria, so long as the terms and conditions are not inconsistent with these criteria.

§ 762.15 Prior contracts.

All contracts under which DOE was providing enrichment services prior to the adoption of these criteria are valid. These prior contracts may be amended to conform to these criteria without penalty, if both parties agree.

Appendix—Finding of No Significant Impact Proposed Revision to the Uranium Enrichment Service Contract

Note.—This appendix will not be printed in the Code of Federal Regulations.

I. Declaration of Finding

The Department of Energy (DOE) has prepared an Environmental Assessment (EA) (DOE/EA-0279), which is available to the public on request, on the proposed revision to the Uranium Enrichment Services Criteria. Based on the findings of the EA, DOE has determined that the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act of 1969. Therefore, no environmental impact statement is required.

II. Description of the Proposed Action

DOE proposes to revise the current Uranium Enrichment Services Criteria to explicitly address the realities of today's highly competitive market for enrichment uranium. In addition to minor conforming amendments, the proposed Criteria provide contracting flexibility to enable DOE to provide enrichment services under terms which are consistent with the Atomic Energy Act, responsive to the needs of enrichment customers, and which maximize the long term competitive position of the United States in the world market. The revised Criteria would also continue the existing policy against restrictions on the enrichment of foreign uranium for use in domestic reactors.

Additional details regarding the description of the proposed action can be found in the Environmental Assessment on Proposed Revision to the Uranium Enrichment Services Criteria.

III. Alternatives Considered

Two reasonable alternatives exist to revising the Uranium Enrichment Services Criteria. They are:

- Do not revise the Uranium Enrichment Services Criteria (No action).
- Revise the Uranium Enrichment Services Criteria, but in a different manner.

No action regarding revision of the Criteria is not a desirable option if the United States is to remain a viable supplier of uranium enrichment services. The impact of not revising the Criteria would probably result in DOE eventually losing some of their customers to foreign uranium enrichment suppliers.

The Criteria could be revised in other ways than those that are proposed. One apparent way that might be proposed during the rulemaking process is to include restrictions on the enrichment of foreign uranium for use in domestic reactors. The domestic uranium mining industry argues that import restrictions would benefit the industry. DOE strongly believes that import restrictions would be detrimental to both DOE and the domestic mining industry. Therefore, DOE believes that import restrictions are not a desirable option.

Additional details on alternatives can be found in the Environmental Assessment on Proposed Revision to the Uranium Enrichment Services Criteria.

IV. Description of Impacts and Justification for Conclusion of No Significance

Operation of the DOE gaseous diffusion plants for uranium enrichment have impacts on the environment, which include impacts on air quality, water quality, land use, and aquatic and terrestrial biota. Operation also requires large amounts of electrical energy. DOE monitors the diffusion plant effluents to assure compliance with environmental standards.

A summary of the environmental impacts of plant operations can be found in the Environmental Assessment on Proposed Revision to the Uranium Enrichment Services Criteria.

The proposed Criteria will reinforce DOE's continuing efforts to conduct enrichment activities in a more businesslike manner. There will be no environmental impacts directly attributable to the proposed revision to the Criteria. The revised Criteria will not affect the impacts previously assessed for operating enrichment plants. Although the flexibility permitted by the revised Criteria may prevent the U.S. from losing more of its current market share, and possibly may increase the anticipated share over the long term, the enrichment plants currently are operating so far below full capacity that no need for additional plants beyond that previously assessed is anticipated in the near future. Therefore, it is concluded that revising the Criteria as proposed is not a major Federal action with a significant effect on the quality of the human environment.

Single copies of the Environmental Assessment on Proposed Revision to the Uranium Enrichment Services Criteria are available from: John P. Thereault, Office of Technology Deployment and Strategic Planning, NE-34, Office of Uranium Enrichment, U.S. Department of Energy, Washington, DC 20545, (301) 353-4710.

FOR FURTHER INFORMATION CONTACT: Robert J. Stern, Director, Office of Environmental Guidance, EH-23, U.S. Department of Energy, Washington, DC [illegible] (202) 252-[illegible]

Date issued: January 10, 1986.

Mary L. Walker,

Assistant Secretary, Environment, Safety and Health.

[FR Doc. 86-[illegible] Filed 1-27-86; 12:00 pm]

BILLING CODE [illegible]

ATTACHMENT B:

PRE-HEARING QUESTIONS AND ANSWERS
RELATING TO THE
FEBRUARY 7, 1986 HEARING
BEFORE THE
HOUSE COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT
WITNESS: JAMES W. VAUGHAN, JR.
ACTING ASSISTANT SECRETARY FOR NUCLEAR ENERGY
U.S. DEPARTMENT OF ENERGY

QUESTIONS SUBMITTED BY CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 1: What is the status of negotiations with the Office of Management and Budget concerning the uranium enrichment program's unrecovered debt? If only partial repayment of the debt is required by OMB will the Department seek to amend the full cost recovery requirement of Section 161v of the Atomic Energy Act? If so, what changes is DOE likely to propose? If not, what would be DOE's legal rational for not recovering all of the government's costs?

Answer: The Department believes that there is sufficient latitude under section 161(v) of the Atomic Energy Act to permit application of judgment in determining unrecovered costs comprising the uranium enrichment program's unrecovered debt without any amendments to the Act.

As originally adopted, section 161(v) provided that prices for enrichment services be established on a basis which would result in "reasonable compensation to the Government." The Joint Committee on Atomic Energy (JCAE) Report on the 1964 amendments to the Atomic Energy Act (AEA or Act) expressed the Committee's awareness that it might not always be practicable for enrichment services prices to recover costs fully. It concluded that, in establishing prices, "(DOE) will have to consider not only the Government's costs in providing enrichment services but also the national interest in the development and utilization of nuclear power." S. Rep. No. 1325, 88th Cong., 2nd Sess., reprinted in 1964 U.S. Code Cong. and Ad. News, 3109, 3121-3122.

Answer 1 (continued): In response to an Atomic Energy Commission (AEC) proposal to establish prices on the basis of hypothetical prices in a non-existent domestic commercial enrichment industry, Congress adopted the current version of section 161(v) which provides that prices for enrichment services "shall be on a basis of recovery of the Government's costs over a reasonable period of time." Pub. L. 91-560, Sec. 8 (1970 Amendment). The 1970 Amendment expressed Congressional misgivings over the establishment of enrichment prices significantly higher than the Government's actual costs which, at best, gave minimal consideration to the other objectives of the AEA. The JCAE Report on the 1970 Amendment emphasizes the change was a clarification to implement the intent of Congress when it originally enacted section 161(v) and thus preserved DOE's considerable flexibility to determine the most effective means to determine and recover the Government's "appropriate" costs and carry out its responsibilities under the AEA. (H. Rep. No. 91-1470, 91st Cong., 2nd Sess., reprinted in 1970 U.S. Code and Ad. News, 4981, 5002-5003, 5012).

Exercising the discretion afforded it under section 161(v), DOE recently reached an agreement with OMB on the uranium enrichment investment and payments to Treasury.

Answer 1
(continued): The principles of the OMB/DOE approach are:

1. The outstanding Government investment should be recovered in a manner that does not damage the Nation's uranium enrichment capability.

2. The uranium enrichment services and pricing structure should be competitive.

3. The recovery plan recognizes both the competitive nature of the international uranium enrichment market and the compelling national mandate for reduction of the federal deficit.

4. The recovery plan recognizes the need for institutional restructuring of the Nation's uranium enrichment services, to include private sector involvement. Initial efforts will focus on transferring future AVLIS development, demonstration, and deployment activities to the private sector. All new enrichment capacity is assumed to be financed totally by the private sector.

Answer 1 (continued): The following is a tabulation of outstanding Government investment derived from a draft financial statement for FY 1985 (dollars in millions):

Asset	Outstanding Government Investment
Plant & Equipment	
Gaseous Diffusion Plants	$ 2,225*
Gas Centrifuge Plant	2,589
Inventory	
Feed	404
Separative Work	1,663
Cumulative Loss	779
Working Capital	(87)
Total	$ 7,573

* Does not reflect $1.2 billion reduction in FY 1984 Financial Statement.

The total outstanding investment will be reduced to $3,481 million by an amount equivalent to 60 percent of the Gaseous Diffusion Plants (GDPs) that are no longer an earning asset and the entire Gas Centrifuge Enrichment Plant (GCEP), which never was and never will be an earning asset. These assets are not being used to provide enrichment services for the benefit of commercial customers. In addition, the outstanding investment will also be reduced by amounts equal to imputed interest charges after these assets were deemed to be "non-earning." These amounts are shown on the table below.

Answer 1
(continued): The Government investment to be recovered by the uranium enrichment program can be derived as follows (dollars in millions):

Total Government Investment	$7,573
Less: 60% of GDP investment	1,200
GDP imputed interest	193
GCEP investment	2,589
GCEP imputed interest	110
Total Unrecovered Investment	$3,481

The imputed interest on outstanding Government investment made prior to October 1, 1986, will no longer be determined by applying the average rate of Treasury borrowings for the current year. Rather, imputed interest on outstanding investment made prior to October 1, 1986, will be computed at an interest rate of 6.319 percent--the average of Treasury rates applicable in the years in which net increases in Government investment occurred, weighted by the dollar amount of these annual increases.

DOE believes today's highly competitive marketplace calls for a pricing approach which can respond to the challenge from abroad. DOE believes pursuing a competitive pricing approach

Answer 1 (continued): is the best way to maximize revenues and, thus, recover the Government's costs over a reasonable period of time, as well as to fulfill its other responsibilities under the Atomic Energy Act. Such an approach will permit DOE to pursue a vigorous program to regain market share, increase its revenue, and assure the recovery of the Government's costs.

DOE is committed to the recovery of appropriate Government costs over a reasonable period of time as required by the Atomic Energy Act. To assist in the attainment of this objective, the proposed agreement between DOE and OMB sets forth a mechanism for the recovery of Government costs. This mechanism would establish reserves sufficient to return to the U.S. Treasury, over a reasonable period of time, previously unrecouped and unrecovered costs associated with the provision of enrichment services to civilian customers.

Scheduled repayments will be set for each fiscal year and the subsequent year through the annual budget process. The Department plans payments to the Treasury of $110 million in FY 1986 and $235 million in FY 1987.

Answer 1 (continued): The repayment agreement and the determination of the enrichment program's unrecovered debt are included within a Notice of Proposed Rulemaking issued by the Department on January 24, 1986, which proposes modifications in the criteria under which DOE offers enrichment services. In the course of the rulemaking proceedings, interested parties will have an opportunity to comment on the terms of the repayment agreement. In addition, the final rule will be submitted to cognizant Congressional committees for a 45-day review period.

QUESTIONS SUBMITTED BY CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 2: What does DOE anticipate to be the effect of the Balanced Budget and Emergency Deficit Control Act of 1985 on the uranium enrichment program? Specifically, on the schedule for development of the AVLIS technology? On DOE's ability to offer competitive prices on the world enrichment market? What options are available to DOE and the Congress for addressing the impact of the Act on the enrichment program?

Answer: The impact of Public Law 99-177, the Balanced Budget and Emergency Deficit Control Act, was a sequester of $61.4 million in FY 1986. This would require some reduction in power purchases and all other program activities as was already planned. A deferral of those funds accompanied the FY 1987 budget submission.

The impact of the Act on the former AVLIS program schedule is minimal in FY 1986. However, the AVLIS program structure and schedule are being revised to reflect the FY 1987 initiative to transfer development and ultimate deployment of the AVLIS technology to the private sector as soon as practical. DOE believes that the Act will not affect its ability to offer competitive prices on the world enrichment market.

QUESTIONS SUBMITTED BY CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 3: Please provide the Committee with a list of production, revenue, and cost projections for each year for the next ten years, including an estimation of how much each figure can be attributable to production of enriched uranium for U.S. military activities. Has the Defense Department traditionally fully reimbursed the enrichment program for costs associated with the production of SWU's for military purposes? If not, what is the total outstanding amount owed to the program?

Answer: The following table shows the expected budget outlays and commercial and Defense revenues for the next 5 years. We are in the process of updating this information for the post-1991 period. Beginning in FY 1986, Defense revenues are equal to the amount of budget outlays required to produce their product. These budget revenues do not, however, include depreciation and interest costs, which are not paid in cash by Government users.

Budget reimbursement to the enrichment program for defense related enrichment requirements began in FY 1983. DOE is currently reexamining the budget reimbursement for defense related enrichment services to ensure that they are paying for the full costs of providing such services.

(The tabulation follows:)

Answer 3 (continued):

Uranium Enrichment Program
($ in Millions)

	1987	1988	1989	1990	1991
Revenues					
Commercial	1,077.9	1,070.0	1,139.0	1,146.0	1,227.0
Defense	208.5	463.0	470.0	450.0	433.0
Total	1,286.4	1,533.0	1,609.0	1,596.0	1,660.0
Enrichment Program Costs*	1,051.4	1,263.0	1,339.0	1,326.0	1,390.0
Production (millions/SWU)	7.6	12.9	14.1	15.4	19.0

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* Assumes that private sector pays for AVLIS deployment

QUESTIONS SUBMITTED BY CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 4: What is the status of ongoing litigation concerning the Utility Services enrichment contract? Please include an overview of DOE negotiations with representatives of the domestic uranium industry, and DOE's strategy for the coming year.

Answer: Litigation concerning the utilities services enrichment contract is proceeding in both the U.S. District Court for the District of Colorado and in the U.S. Court of Appeals for the Tenth Circuit.

DOE has noticed its appeal of the judgment of the district court in which the court ruled that the utility services contract was null and void. No briefing schedule has been established by the court.

The district court has before it motions for summary judgment on the four counts remaining in the case, and the court has scheduled oral argument on such motions for April 10, 1986.

In December 1985, the parties to the suit entered into settlement negotiations to resolve the litigation. Plaintiffs notified the court that negotiations have been unsuccessful.

Answer 4 (continued):

The Department of Energy (DOE) published in the Federal Register on January 24, 1986, a Notice of Proposed Rulemaking which proposes modifications to the criteria under which DOE provides uranium enrichment services. These proposed criteria are responsive to the realities of the current marketplace and will enable the Department to carry out more effectively its statutory mandate under the Atomic Energy Act.

During the rulemaking, all representatives of the uranium mining industry as well as other interested parties will have the opportunity to comment on the proposed rules.

On February 5, 1986, the Government moved the U.S. Court of Appeals for the Tenth Circuit to stay proceedings on appeal pending completion of DOE's rulemaking.

QUESTIONS SUBMITTED BY CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 5:	What, if any, action is anticipated by DOE as a follow-up to the report issued by the United States Trade Representative concerning the status of the domestic uranium industry?
Answer:	The Department will continue to monitor closely the domestic uranium producing industry. We will also examine ways of increasing the requirements for domestic natural uranium. For example, as part of our recent incentive price package, we will permit the holders of the Utility Services (US) contract who take 100 percent of their needs from DOE to use the Variable Tails Assay Option (VTAO) free of any surcharge through the period FY 1987 to 1995. Free VTAO will stimulate increased natural uranium usage since the economically optimum tails assay will increase as a result. We expect that the domestic holders of the US contract would increase their requirements by an average of about 2 to 3 million pounds of uranium concentrate per year over the FY 1987 to 1995 period. We will also work to strengthen the underlying structure of the domestic nuclear industry, which should assist the domestic uranium industry.

QUESTIONS SUBMITTED BY MORRIS K. UDALL

Uranium Enrichment

Question 6: Please provide a statement on DOE's obligation to pay the Tennessee Valley Authority for unused capacity. What is the status of DOE's efforts to terminate or mitigate this obligation?

Answer: DOE executed the original contracts with the Tennessee Valley Authority (TVA) in 1967. The contract obligated TVA to provide and DOE to take varying amounts of electricity during the term of the contracts. The annual power levels were established based on DOE's existing enrichment contracts with foreign and domestic customers. TVA required an 8 year leadtime to change the contract levels for any given year. The Department has had excess (unused) power under contract since FY 1981 due to slippages in contracts for uranium enrichment services and terminations by its customers due to decreased demand. Current planning shows this excess TVA power under contract existing through FY 1991. Through FY 1985, DOE has paid $826 million to TVA for unused power. Estimated payments for FY 1986 through FY 1991 are about $2.0 billion, for an 11-year total of about $2.8 billion for unused power.

Answer 6 (continued): Unsuccessful attempts to obtain relief from the TVA capacity charges have been underway since 1981. Items which have been considered include:

- Outright relief from the capacity charges.
- Resale of TVA power by DOE and/or purchase of power from other utilities by DOE.
- Utilization by DOE of seasonal and/or unfirm power from TVA.
- Near-term relief in exchange for additional contractual arrangements beyond the terms of the current power contracts.
- Bartering of goods and services.

After exploring each of these options, no solution to the excess power under contract problem has been found. One option, which DOE has utilized, is to exercise its contractual right to cancel, with an 8-year notice, contract demand. Since December 1981, DOE has cancelled 4,000 megawatts of its total TVA contract demand of 4,485 megawatts. These cancellations, in 1,000 megawatt blocks, begin in December 1989 and end in December 1992. DOE is now studying the benefits of cancelling a portion of the remaining 485 megawatts. These cancellations reduce DOE's contract obligations for capacity charges over the life of the contracts by about $900 million.

STATEMENT BY
BEN C. RUSCHE
DIRECTOR
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
BEFORE THE
SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
U.S. HOUSE OF REPRESENTATIVES

FEBRUARY 7, 1986

Mr. Chairman and Members of the Subcommittee:

I am pleased to appear before you today to present the FY 1987 budget for the U.S. Department of Energy's (DOE's) Office of Civilian Radioactive Waste Management. I will highlight the major activities planned for FY 1987 under the Nuclear Waste Fund program, as well as under the Civilian Radioactive Waste Research and Development program and provide a current status of implementation of and plans under the Nuclear Waste Policy Act of 1982 (NWPA). In addition, I have submitted answers to specific questions you provided to the Department in your letter of invitation. Since the NWPA requires the annual submission of a triennial budget under the Nuclear Waste Fund, in my discussion of the FY 1987 Nuclear Waste Fund program, I will include estimates for FY 1988 and FY 1989.

BUDGET OVERVIEW

The NWPA created the Nuclear Waste Fund which is financed by fees collected from owners and generators of spent nuclear fuel and high-level radioactive waste. The FY 1987 budget request for the Nuclear Waste Fund is $769.3 million, compared to $499.0 million for FY 1986. The Nuclear Waste Fund budget estimate for FY 1988 is $863.0 million and for FY 1989 is $799.2 million.

Research and development (R&D) activities not financed under the Nuclear Waste Fund are funded under the Energy Supply R&D appropriation in a program entitled Civilian Radioactive Waste R&D. The FY 1987 budget request for Civilian Radioactive Waste R&D is $6.5 million, compared to $16.0 million in FY 1986.

The FY 1986 budget request for budget authority funded by the Nuclear Waste Fund is summarized in Table 1. The FY 1987 Departmental budget request for Civilian Radioactive Waste R&D is summarized in Table 2. Under the Nuclear Waste Fund, the increased FY 1987 request will provide for extensive site characterization activities to begin exploratory shaft design and construction and to conduct intensive engineering tests and analyses to support the waste package and repository designs for the first repository. These activities will be conducted at each of the three candidate repository sites approved by the President for site characterization. DOE plans to formally recommend three sites for characterization to the President in Spring 1986.

The increase in FY 1987 will also provide for preparation for site field investigations in crystalline rock under consideration for a second repository and design of the second repository. While construction of a second repository is not authorized by Congress, other activities involving siting and design of a second repository are required under the NWPA.

In addition to an increase in the budget related to the repository activities, the FY 1987 budget request also represents a significant increase over FY 1986 in activities related to Monitored Retrievable Storage (MRS), should Congress adopt the proposal required by Section 141 of the NWPA, and which we will submit next week. The FY 1987 request of $46.0 million compared to $3.0 million in FY 1986 supports Congressional approval to proceed with activities that are critical to the deployment of an MRS facility in Tennessee. In that proposal, DOE will recommend the construction of an MRS in Tennessee to receive, consolidate and package spent fuel for bulk shipment to a repository. I will later in my testimony discuss the details of the proposal.

The program proposed to be funded from the Nuclear Waste Fund puts first priority on the first geologic repository and the associated transportation, integration and management systems. Second priority is given to MRS because of its potential for improving the overall system, followed by a third priority to the second repository siting activity. Neither the MRS nor the second repository is authorized for construction by the NWPA, but it is clear that the MRS offers the earliest and best means for assuring that the objectives of the NWPA are carried out.

TABLE 1

FY 1987 CONGRESSIONAL BUDGET
NUCLEAR WASTE FUND
($in Thousands)

	FY 1986 Approp.	FY 1987 Request
NUCLEAR WASTE FUND		
Repository Development		
o First Repository	$386,050	$541,800
o Second Repository	35,500	78,700
Monitored Retrievable Storage	3,000	46,000
Transportation and Systems Integration	21,275	33,375
Program Management and Technical Support	53,212	69,474
TOTAL	499,037	769,349
Projected Receipts		
o One mill/KWh fee	378,600 1/	420,500 1/
o One-time fee	2,300	2,500
TOTAL	380,900	423,000
Interest Income	118,000 2/	115,000 2/
TOTAL	498,900 2/	538,000 2/
Staffing Full-Time Equivalents (FTE's)	292	292

1/ Based on projected gross nuclear electricity generation reduced by 5% to approximate net nuclear electricity generation as a result of the recent Wisconsin court decision. (Wisconsin Electric Power Company, et al vs Hodel, 83-1066,84-8571 (decided December 6, 1985)). At the time of this budget submission, net nuclear electricity generation projections were not available.

2/ Based on average yield of Treasury security portfolio.

TABLE 2

FY 1987 CONGRESSIONAL BUDGET
ENERGY SUPPLY RESEARCH AND DEVELOPMENT ACTIVITIES
($ in Thousands)

	FY 1986 Approp.	FY 1987 Request
CIVILIAN RADIOACTIVE WASTE R&D		
Spent Fuel Storage Development	$ 8,554	$ 6,300
Alternative Disposal Concepts	7,207	------
Program Direction	303	200
TOTAL	$ 16,064 a/	$ 6,500
Staffing FTE's	5	3

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a/ Reflects a general reduction of $30,000; APD Reduction, and a reduction of $631,000 in compliance with the Gramm-Rudman-Hollingc Deficit Reduction Act, PL 99-177.

An increase in Transportation and Systems Integration in FY 1987 is also requested. The FY 1987 request of $33.4 million compared to the FY 1986 appropriation of $21.3 million from the Nuclear Waste Fund represents an effort to be initiated during FY 1986 for the private sector to design, fabricate and test prototype casks for DOE to consider in developing transportation casks for shipping spent fuel from reactors directly to a repository or from reactor to an MRS.

The FY 1987 budget request under the Civilian Radioactive Waste R&D program of $6.5 million represents a decrease from the FY 1986 budget of $16.0 million. Essentially, this results from the fact that no funds are being requested for research and development concerning alternatives for permanent disposal of spent fuel and high-level waste. During FY 1986 and previous years, the principal alternative disposal concept funded has been subseabed disposal. Activities related to research and development in alternative disposal concepts called for in Section 222 of the NWPA are not proposed for funding after FY 1986.

NUCLEAR WASTE FUND PROGRAM

With the overview of the FY 1987 budget request in mind, I would like now to give a brief status of the program and at the same time to try to answer the questions you provided concerning implementation of the program.

The NWPA calls for DOE to site, design, construct, operate and close the Nation's first geologic repository for spent fuel and high-level waste; to site and design a second repository; to submit a proposal to Congress on the need for and feasibility of Monitored Retrievable Storage facilities; to develop a transportation system and carry out certain other activities in support of the development of a disposal system. It established a method of disposal, a schedule, technical processes and a funding mechanism -- the Nuclear Waste Fund -- to ensure successful implementation of the NWPA.

Interwoven throughout these activities is the requirement for an extensive system of interactions providing checks and balances to ensure Federal accountability to the States, affected Indian Tribes, the public, the electric utilities, their ratepayers and the Congress. To ensure the accountability of the Federal Government -- specifically, DOE -- to the other parties and concerned citizens, we have on many occasions expanded the interactive process beyond that called for in the NWPA. We have been undertaking steps to ensure that the affected States and Indian Tribes can provide early input to DOE's decisionmaking processes. For example, we have invited affected States and Indian Tribes to participate in the Office of Civilian Radioactive Waste Management internal coordinating group on socioeconomic and environmental issues.

In spite of these actions, DOE is often criticized by many of the affected parties for not providing the opportunity for "effective" participation. In passing the NWPA, Congress found that "State and public participation in the planning and development of repositories is essential in order to promote public confidence in the safety of disposal of such waste and spent fuel...." My reading of that finding is that not only does the Federal Government have to be accountable to the affected and interested parties in the Nation, but so do the other participants. An important part of the FY 1987 budget request is to fund participation by States and Indian Tribes.

I do not believe it is the intent of Congress to fund participation to thwart progress in developing a disposal system that will provide reasonable assurance that the public and the environment will be adequately protected from the hazards posed by high-level waste and spent fuel. Effective participation is, I believe, participation for the purpose of ensuring that the resulting decisions will adequately protect the public health, safety and environment.

Repositories

To date, DOE has identified nine potentially acceptable sites for the first repository, prepared draft Environmental Assessments which propose five of those sites as suitable for site characterization and propose three of the five sites for recommendation to the President for site characterization.

A lengthy review process was undertaken in which DOE reviewed approximately 23,000 comments received on the draft Environmental Assessments. Based on comments, we selected one of three ranking methodologies which have been identified in the draft EA's to be used in the decision process to formally recommend sites for characterization. At the suggestion of several commentors, last fall, we requested the National Academy of Sciences (NAS) Board on Radioactive Waste Management to conduct an independent review of the appropriateness of the ranking methodology -- referred to as the utility estimation method.

The NAS Board responded that the methodology, if properly applied, is appropriate, but further recommended that the application of the methodology be reviewed. Therefore, over the last several months, while DOE has been completing final Environmental Assessments to accompany the formal nomination of sites for characterization and applying the ranking methodology in the recommendation decision process, the NAS Board and DOE have met several times on this subject. We expect to have a final review session in late March.

We consider the review by the NAS Board to be quite valuable in ensuring us, as well as the public, that the decisions being made in the siting process are indeed scientifically and technically sound. Based on our discussions with the NAS Board, we currently expect to issue final Environmental Assessments and formally nominate and recommend sites for characterization this Spring, around the end of April. The formal nomination and recommendation will be based on siting guidelines (10 CFR 960), utilizing available geotechnical, environmental and other relevant information contained in the Environmental Assessments, and will be accompanied by Environmental Assessments and the comments provided by the NAS Board.

The FY 1987 budget request for first repository activities is $541.8 million compared to the FY 1986 appropriation of $386.0 million. This increase is primarily due to the site characterization activities which are planned to commence in FY 1987. The extensive site evaluation involved in site characterization includes construction of deep, exploratory shafts at the three sites approved for site characterization and in situ testing. DOE is planning two shafts at each site. Shaft construction at the three sites will take approximately two years with in situ tests scheduled to start in FY 1989.

The FY 1988 budget estimate for first repository activities is $632.4 million and the FY 1989 budget estimate is $571.5 million.

Major program milestones associated with the first repository are:

Milestone	Calendar Year
o Issue final environmental assessments	April 1986
o Nominate at least five sites and recommend three candidate sites to President for characterization	April 1986
o Issue initial Site Characterization Plans (SCP) for tuff and basalt candidate sites	December 1986
o Issue initial SCP for salt candidate site	May 1987
o Begin construction of first exploratory shaft	May 1987
o Issue Final Environmental Impact Statement	1991
o Recommend first repository site to President	1991
o Recommend first repository site to Congress	1991
o Submit construction application to NRC	1991
o Receive from NRC Construction Authorization	1993-1994
o Begin Phase I Operations	1998

As previously mentioned, the NWPA directs DOE to conduct site investigations for a second repository, although construction of the second repository is contingent upon future Congressional authorization. The process for selecting the second repository site is similar to the process for the first repository with decision points approximately seven to ten years later than those for the first repository.

For the second repository, DOE may consider sites identified as potentially acceptable but not nominated for the first repository, sites found potentially acceptable from rock formations not previously studied in the first repository selection process and sites characterized but not chosen for the first repository site.

Rock formations not previously studied in the first repository selection process have been crystalline rock. Following national surveys, DOE identified 235 crystalline rockbodies in 17 States in three regions -- the North Central, the Northeast and the Southeast parts of the country.

In the "regional phase" of investigation, DOE collected and assessed publicly available geologic and environmental data, reviewed these data with the States and prepared Regional Environmental and Geologic Characterization Reports for each of the three Regions. In addition, through workshops and other interactions with the crystalline States, DOE prepared a Region-to-Area Screening Methodology to be used for narrowing down the 235 rockbodies to a small number of areas preferred for further study.

On January 16, 1986, following application of the Screening Methodology to the data contained in the Regional Characterization Reports, we issued for public comment a Draft Area Recommendation Report (ARR). The Draft ARR proposes from among the 235 rockbodies in 17 States, 12 potentially acceptable sites in 7 States. The 7 States, listed in alphabetical order, are:

Georgia, Maine, Minnesota, New Hampshire, North Carolina, Virginia and Wisconsin. The Draft ARR also identifies 8 other areas in the same 7 States as suitable for possible further consideration.

During the public comment period on the Draft ARR, DOE will hold more than 70 public briefings and public hearings in all 17 States. After review of the oral and written comments received on the Draft ARR, DOE will issue a final ARR, formally identify potentially acceptable sites in crystalline rock and begin the "area phase" activities for those areas determined potentially acceptable sites for the second repository. Area phase activities include on-site investigations to collect and assess geologic, environmental, socioeconomic and transportation data.

The FY 1987 budget request for second repository activities is $78.7 million compared to the FY 1986 budget appropriation of $35.5 million. The increase is principally to fund preparation for on-site area-phase work which is scheduled to begin in FY 1988 and take approximately three-to-five years. The FY 1988 estimate for second repository activities is $74.2 million and the FY 1989 estimate is $71.5 million.

The major milestones leading to the site recommendation for the second repository are as follows:

Milestones	Calendar Year
o Issue final Region-to-Area Screening Methodology	April 1985
o Issue final regional characterization reports	September 1985
o Issue draft Area Recommendation Report	January 1986
o Issue final Area Recommendation Report	November 1986
o Identify Potentially Acceptable Sites	November 1986
o Issue final Area Characterization Plan and initiate crystalline rock area phase field investigations	November 1987
o Nominate and recommend sites to President for characterization	1993
o Recommend second repository site to Congress	1999

Monitored Retrievable Storage

The NWPA (Section 141) directs DOE to complete a study of the need for and feasibility of an MRS, and to submit to the Congress a proposal for the construction of one or more MRS facililties. The NWPA specifies that the proposal include a program for siting, development, construction and operation of an MRS facility; site specific designs and cost estimates for the construction of such a facility, should Congress approve its construction; a plan for funding the construction and operation of such a facility; and a plan for integrating such a facility into the overall Federal waste management system.

In spring of 1985, DOE completed its analysis of the need for and feasibility of an MRS facility and announced our conclusion that such a facility could serve as an integral and important part of the overall waste disposal system. With approval of this Committee and others, we reprogrammed funds to allow us to prepare the full MRS proposal. We identified a preferred site and two alternative sites, as required by the NWPA. The preferred site is the site of the cancelled Clinch River Breeder Reactor in Oak Ridge, Tennessee; and the two alternate sites are also in Tennessee -- one on the DOE Oak Ridge Reservation and the other near Hartsville. In addition, we completed the need and feasibility studies verifying our tentative conclusions. We paid special attention to evaluating the no-MRS case as the Subcommittee emphasized.

Over the last nine months, we have worked closely with Tennessee in our development of the proposal to Congress. This interaction has principally been through Tennessee Governor Alexander's Safe Growth Council. To support their review of the proposal, we provided a grant of $1.4 million. The State in turn provided $100,000 each to the Clinch River MRS Task Force and the Hartsville Area Study Group to study the MRS proposal.

The Clinch River MRS Task Force completed their review in October 1985 and issued a report entitled "Recommendations on the Proposed Monitored Retrievable Storage Facility." In their report, the Task Force concluded that an MRS could be safely constructed and operated. In addition, Task Force members from the City of Oak Ridge and from Roane County passed resolutions stating that an MRS facility would be acceptable if certain conditions were met. In our proposal to Congress, which I will discuss in more detail in a moment, we have attempted to meet those conditions.

In mid-December 1985, and as required by the NWPA, we submitted to the Nuclear Regulatory Commission (NRC) and to the Environmental Protection Agency (EPA) review copies of the Proposal to Congress, the Environmental Assessment on the MRS and an MRS Program Plan. At the same time, we provided copies to the State of Tennessee.

On January 21, 1986, Governor Alexander met with the Secretary of Energy and me to present the State's position on our proposal to construct an MRS at the Clinch River site. We are disappointed that the Governor does not share our view of the need for and value of an MRS. We are pleased that he, like the Clinch River MRS Task Force, shares our view that such a facility could be constructed and operated safely and is not a substitute for a permanent repository.

I would like to state for the record that in preparing the MRS Proposal to Congress, rarely have I seen such an excellent example of the results that positive Federal, State and local government cooperation can yield. I would hope that other State and local governments would take note of this mutually beneficial experience so that similarly close cooperation and participation might be realized elsewhere in the program.

We have met with and received comments on the MRS Proposal to Congress from both NRC and EPA. Neither the NRC nor EPA comments have required major changes to the proposal. We plan to submit the Proposal to Congress within the next few days. The proposal will be accompanied by NRC comments and EPA comments.

In our proposal, we will recommend that Congress:

- Approve the construction of an MRS facility at a site on the Clinch River in the Roane County portion of Oak Ridge, Tennessee;
- Limit the storage capacity at the MRS facility to 15,000 metric tons of spent fuel;
- Preclude waste acceptance by the MRS facility until a construction authorization for the first repository is received from the NRC;
- Direct DOE to implement measures responsive to the concerns and recommendations of the State of Tennessee and local governments; and,
- Direct DOE to implement the program plan accompanying the proposal.

The proposal contains extensive and unique provisions with regard to State and local involvement in the MRS program. The most innovative and far-reaching element contained in the proposal is the establishment of an MRS Steering Committee to provide a formal mechanism to obtain State and local input, including recommendations and evaluations regarding the design, construction, operation and, eventually, the decommissioning of the MRS facility. This Committee, composed of State and local government representatives of their own choosing, as well as DOE and industry representatives, would provide guidance, conduct evaluations, and, if necessary, recommend corrective actions with regard to the MRS facility. We are proposing that the Committee's involvement extend to a number of areas --

environment, safety and health; transportation; public information; and financial matters.

In accordance with other provisions of the NWPA, should Congress approve proceeding with an MRS facility, we are committed to seeking immediately to enter into a formal Consultation and Cooperation Agreement with the State of Tennessee.

The FY 1987 budget request supports proceeding with activities that are critical to deployment of an MRS facility. With this in mind, the FY 1987 request for MRS activities is $46 million compared to the FY 1986 budget appropriation of $3 million. These funds would be used primarily for site data collection and analysis, final design of the facility itself, regulatory compliance studies and State liaison activities. The schedule for construction of the MRS allows ten years from the time Congress approves our proceeding, to the start up of operations. The FY 1988 estimate is $50 million and the FY 1989 estimate is $53 million.

Nuclear Waste Fund

In April 1983, DOE adopted a fee of one mill (one-tenth of a cent) per kilowatt hour charged to utilities for all nuclear-generated electricity beginning April 7, 1983, as specified in the NWPA. Revenues collected from the on-going fee by DOE through December 31, 1985, total approximately $880 million.

In addition to spent fuel generated since April 7, 1983, spent fuel or high-level waste generated prior to that date is subject to a fee equivalent to an average charge of one mill per kilowatt hour. Utilities had until June 1985 to decide on one of three payment options. Those who chose to pay in one lump sum by June 1985, to save interest charges, made payments totalling more than $1.4 billion. This represents more than half of the one-time fee liability of $2.3 billion for civilian nuclear waste in existence prior to April 7, 1983. Following receipt of these monies, DOE reimbursed the U.S. Treasury approximately $265 million, the total amount owed on the appropriated debt transferred to the Nuclear Waste Fund upon enactment of the NWPA.

In April 1985, the President accepted DOE's recommendation to dispose of defense waste in a commercial repository. The Federal Government, therefore, will pay an equivalent fee to that paid by utilities. This use of the repository will generate additional revenue for the Fund. The amount of the additional revenue is presently being determined and, therefore, is not included in our revenue estimates. We are in the final stages of discussions with DOE's Office of Defense Programs to determine an equitable cost-sharing methodology.

The revenue projections based on the one mill per kilowatt hour fee are shown in Table 3.

TABLE 3

NUCLEAR WASTE FUND REVENUE PROJECTIONS
($ in millions)

FY 1983 (actual)	$ 73.6
FY 1984 (actual)	329.5
FY 1985 (actual):	
-One mil/KWh	367.3
-One-time fee	1,427.4
-Interest Earned	38.4
FY 1986	
-One mil/KWh	378.6 a/
-One-time fee	2.3
-Interest Earned	118.0 b/
FY 1987	
-One mil/KWh	420.5 a/
-One-time fee	2.5
-Interest Earned	115.0 b/
FY 1988	
-One mil/KWh	474.5 a/
-One-time fee	17.2
-Interest Earned	105.0 b/
FY 1989	
-One mil/KWh	508.6 a/
-One-time fee	17.5
-Interest Earned	99.0 b/

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a/ Based on projected gross nuclear electricity generation reduced by 5% to approximate net nuclear electricity generation as a result of the recent Wisconsin court decision. (Wisconsin Electric Power Company, et al vs. Hodel, 83-1066,84-8571 (decided December 6, 1985)). At the time of this budget submission, net nuclear electricity generation projections were not available.

b/ Based on average yield of Treasury security portfolio.

Transportation and Systems Integration

The FY 1987 budget request for activities associated with Transportation and Systems Integration is $33.4 million. The FY 1988 estimate is $33.8 million; and the FY 1989 estimate is $31.0 million.

The funding request for FY 1987 provides for development of adequate transportation and integrated systems for the shipping and management of nuclear waste among the various components of the disposal system.

The FY 1987 major activities include funding for the private sector to design, fabricate and test prototype casks for truck, rail and barge transport based on competitive procurements. Work will be continued to support institutional programs environmental and economic analysis and technology development, data systems and testing and engineering development and systems integration.

The FY 1988 and FY 1989 estimates of $33.8 million and $31.0 million, respectively, would fund the continuation of these efforts.

Program Management and Support

The FY 1987 budget request for program management and technical support is $69.5 million. The FY 1988 estimate is $72.7 million; and the FY 1989 estimate is $72.2 million.

The FY 1987 funding level of $69.5 million provides technical support for waste management activities including (a) technical support integration, (b) development of standard materials characterization methods by the Material Characterization Center, and (c) supporting studies including fund management activities.

This funding level provides for a sustained staffing level from FY 1986 to FY 1987 of 292 full-time equivalent positions at headquarters and in the Operations Offices for fund management, site investigation, technology development and institutional liaison associated with the technical management of the repository, MRS (if approved), supporting programs and the management of the Nuclear Waste Fund.

The FY 1988 and FY 1989 estimates of $72.7 million and $72.2 million, respectively, will provide for program management and technical support associated with site characterization activities at three candidate repository sites, intensified siting efforts in the second repository program, a vigorous MRS program and increasing efforts in transportation systems development. Major emphasis will continue on developing an integrated cost-effective waste disposal system providing full protection of public health and safety and the environment.

CIVILIAN RADIOACTIVE WASTE R&D PROGRAM

Development and demonstration activities under the Civilian Radioactive Waste R&D Program are funded from the General Fund rather than funds collected from the utilties and deposited into the Nuclear Waste Fund.

The FY 1987 budget request for the Civilian Radioactive Waste R&D activities is $6.5 million compared to $16.0 million in FY 1986.

I would like to briefly discuss the strategy and highlight the activities which we plan to undertake in FY 1987.

Strategy

DOE's Civilian Radioactive Waste R&D program efforts are to utilize all means directed or available through the Act or other authority to encourage and expedite the availability of licensed new at-reactor storage technologies. No funds are requested for research and development concerning alternative means and technologies for the permanent disposal of high-level radioactive wastes, including the subseabed disposal concept. Activities to implement Section 222 -- alternative means of disposal -- are not proposed after FY 1986 because of the need to set stringent priorities on use of appropriations from the General Fund.

Spent Fuel Storage R&D

DOE's spent fuel storage development program is intended to encourage and expedite the most efficient use of existing storage facilities and the addition of new, licensed capacity in a timely fashion. The FY 1987 budget request to support these activities is $6.3 million compared to $8.5 in FY 1986.

Activities in FY 1987 will include continued dry storage cask testing as part of a cooperative agreement with Virginia Power; completion of preliminary tests and analyses on a transportable cask as part of a cooperative agreement with Carolina Power and Light; and initiation of rod consolidation demonstrations of spent fuel as part of a cooperative agreement with Northeast Utilities Services Company. In addition, we plan to continue cooperative activities in information exchange regarding spent fuel storage and disposal with non-nuclear weapon states and to continue to participate in international activities with the International Atomic Energy Agency, the Nuclear Energy Agency and the Federal Republic of Germany.

We do not plan to continue investigations into alternative disposal concepts, including subseabed disposal, nor generic methods and support studies beyond those international information exchanges and international involvement discussed under spent fuel storage development due to funding limitations for R&D programs.

Program Direction

The FY 1987 budget request for program direction is $.2 million. At this level, three full-time equivalents would be funded to manage the Civilian Radioactive Waste R&D programs. Included are administrative and technical personnel who manage a broad range of activities such as: research, development, demonstration, industrial involvement and international programs.

In summary, Mr. Chairman, the FY 1987 budget request for spending authority under the Nuclear Waste Fund and for appropriations under the Civilian Radioactive Waste R&D budget are designed to carry out an integrated waste managment program in an efficient and effective manner and to achieve the 1998 mandate of the Nuclear Waste Policy Act, that is, to have in place a comprehensive and functional waste disposal system to begin receiving spent fuel.

This concludes my remarks in support of the FY 1987 Nuclear Waste Fund and R&D programs. I shall be pleased to answer your questions at this time.

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February 18, 1986

The Honorable John S. Herrington
Secretary of Energy
Washington, D.C. 20585

Dear Secretary Herrington:

As you know, on February 7, the Subcommittee on Energy and the Environment conducted a hearing on the Department's fiscal year 1987 budget for the nuclear energy programs within the Subcommittee's jurisdiction. Mr. James W. Vaughan, Jr., Acting Assistant Secretary for Nuclear Energy, and Mr. Ben C. Rusche, Director of the Office of Civilian Radioactive Waste Management, testified.

I have attached follow-up questions on issues that were raised at the hearing. I would appreciate your assistance in completing the hearing record by making certain that these questions are answered in a timely manner.

Thank you for your attention to these matters.

Sincerely,

Mo Udall
MORRIS K. UDALL
Chairman

Attachment

HEARING ON DOE FY-87 BUDGET REQUEST

QUESTIONS FOR JAMES W. VAUGHAN, JR.
ACTING ASSISTANT SECRETARY FOR NUCLEAR ENERGY

Uranium Enrichment

1. The Department is proposing to pay back only about $3.5 billion of the $7.5 billion in prior unrecovered costs of the enrichment program. How does the Department square writing off more than $4 billion of unrecovered costs with the full-cost-recovery requirement of the Atomic Energy Act?

2. What is the basis for the Department's position that only "appropriate" costs need to be recovered? What criteria were used to determine whether costs were "appropriate" or not?

3. DOE reasons that only forty percent of the cost of the Gaseous Diffusion Plants should be recovered since only forty percent of the plants' capacity is used in providing enrichment services. If, at some future date, DOE uses more than forty percent of the capacity of the Gaseous Diffusion Plants, will the Department recover more than forty percent of the cost of that capacity? If not, why not?

4. Are continuing reductions in the price of DOE's enrichment service justifiable in light of the write-off of more than half of the program's unrecovered debt?

5. To what extent have the recent price reductions succeeded in recapturing part of either the domestic or foreign market for enrichment services?

6. What is the basis for treating the Utility Services enrichment contracts as still in force despite the federal court decision declaring them null and void?

   What effect would implementation of the proposed changes to the enrichment criteria have on the federal court decision?

7. What do you perceive to be the primary purpose of the Department's enrichment enterprise--to serve the nation's nuclear nonproliferation goals; to provide a service to U.S. utilities; or to preserve the domestic uranium mining and milling industry?

   In view of the fact that DOE's foreign competitors have captured about 60 percent of the foreign market for enrichment services, does the enrichment program provide any leverage to further U.S. nonproliferation goals at this time?

8. Is the Department's agreement with the Office of Management and Budget on the amount of unrecovered costs that are to repaid committed to writing? If so, please submit for the record.

Privatization of the Enrichment Enterprise

9. What is the status of DOE efforts to convince the private sector to fund and build the first Atomic Vapor Laser Isotope Separation (AVLIS) enrichment plant?

10. What, if any, financial incentives or assurances will the Federal Government be expected to offer to attract private sector participation?

11. What impact would the private sector's unwillingness to assume financial responsibility for AVLIS have on the viability of DOE's enrichment program? Would DOE proceed with development of AVLIS itself if the private sector does not?

12. What steps would be taken to safeguard our nuclear nonproliferation interests if the AVLIS program is privatized?

Domestic Uranium Industry

13. What actions has the Department taken since the Secretary determined that the domestic uranium mining and milling industry is non-viable?

    To what extent has the industry improved as a result of those actions?

14. What is the basis for your conclusion that restrictions on foreign uranium will not help the domestic industry?

15. What part of the domestic uranium market is uncommitted and available for capture by foreign uranium suppliers?

TVA Contract

16. What options has the Department considered to reduce its obligation to pay the Tennessee Valley Authority for unused

electricity? What are the roadblocks preventing an elimination or reduction of this obligation?

Uranium Mill Tailings Cleanup

17. When do you expect to complete the cleanup of uranium mill tailings sites? What effect will Gramm-Rudman have on the timely completion of this program?

Price-Anderson

18. What impact on the Department's operations would you expect from adoption of proposals allowing the federal government to recover Price-Anderson indemnification payments from any contractors or subcontractor that may have been responsible for an accident arising from a contract activity?

    Would adoption of such a proposal improve the safety consciousness of DOE contractors and their subcontractors and suppliers?

HEARING ON DOE FY-87 BUDGET REQUEST

QUESTIONS FOR BEN C. RUSCHE
DIRECTOR, OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

Monitored Retrievable Storage

1. What impact will the February 5, 1986 decision of the U.S. District Court for the Middle District of Tennessee have on submittal of the MRS proposal to Congress as required by the Nuclear Waste Policy Act?

2. DOE is proposing that the Congress limit the MRS storage capacity to 15,000 metric tons of spent nuclear fuel. This is approximately the amount of spent fuel generated in 5 years by 100 reactors. How did DOE arrive at this specific capacity limit? What is the technical basis for limiting storage capacity to this amount?

3. Under the proposed system including an MRS, spent fuel from Western reactors will be shipped directly to the repository rather than first to the MRS. If MRS funding comes from the Nuclear Waste Fund, as is proposed, Western reactors will be paying for the MRS even though their spent fuel is not shipped there. What provisions, if any, will be made to accommodate those reactors which are paying for the MRS through their contributions to the Fund but whose spent fuel will not be shipped there?

4. In its normal operating mode, will all of the spent fuel transported directly to the MRS facility--spent fuel from Eastern reactors--be stored on-site for some period of time, or will much of this spent fuel be processed, packaged and transported to the repository without being stored at the MRS? If not all spent fuel shipped to the MRS will be stored there, is there an inconsistency between DOE's proposed funding plan whereby all utilities will pay for the MRS--regardless of whether their spent fuel is stored at the facility--and the requirement of the act that the cost of the MRS will be borne by those whose spent fuel is stored there?

5. What sites other than the three proposed sites in Tennessee were considered? How would the value of the MRS be changed if the MRS were located somewhere other than Oak Ridge, Tennessee?

Low-Level Waste

6. Please provide for the record a summary of your efforts to fulfill your responsibilities under the Low-Level Radioactive Waste Policy Amendments Act of 1985.

Research on Subseabed Disposal

7. What conclusions can be drawn as to the feasibility of the permanent subseabed disposal of radioactive waste based upon research conducted to date? What impact will termination of this research have on international research programs in this area? How much additional funding would be necessary to complete the current research program?

Department of Energy
Washington, DC 20585

March 11, 1986

Honorable Morris K. Udall
Chairman, Committee on Interior
  and Insular Affairs
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

On February 7, 1986, James W. Vaughan, Jr., Acting Assistant Secretary for Nuclear Energy, and Ben C. Rusche, Director of the Office of Civilian Radioactive Waste Management, appeared before the Interior and Insular Affairs Subcommittee on Energy and the Environment, concerning the Fiscal Year 1987 budget request for nuclear energy and civilian radioactive waste.

Following that hearing, you submitted written questions for our response to supplement the record. Enclosed are the answers to those questions, which also have been sent directly to the Committee staff.

If you have any questions, please have your staff call Mike Gilmore or Cathy Hamilton on 252-4277. They will be happy to assist.

Sincerely,

Robert G. Rabben
Assistant General Counsel
for Legislation

Enclosure

POST-HEARING QUESTIONS AND ANSWERS
RELATING TO THE
FEBRUARY 7, 1986 HEARING
BEFORE THE
HOUSE COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT
WITNESS: JAMES W. VAUGHAN, JR.
ACTING ASSISTANT SECRETARY FOR NUCLEAR ENERGY
U.S DEPARTMENT OF ENERGY

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question [illegible] The Department is proposing to pay back only about $3.5 billion of the $7.5 billion in prior unrecovered costs of the enrichment program. How does the Department square writing off more than $4 billion of unrecovered costs with the full-cost-recovery requirement of the Atomic Energy Act?

Answer: The Department believes that there is sufficient latitude under section 161.v. of the Atomic Energy Act to permit application of judgment in determining unrecovered costs for the uranium enrichment program without any amendments to the Act.

As originally adopted, section 161.v. provided that prices for enrichment services be established on a basis which would result in "reasonable compensation to the Government." The Joint Committee on Atomic Energy (JCAE) Report on the 1964 amendments to the Atomic Energy Act (AEA or Act) expressed the Committee's awareness that it might not always be practicable for enrichment services prices to recover costs fully. It concluded that, in establishing prices, "(DOE) will have to consider not only the Government's costs in providing enrichment services but also the national interest in the development and utilization of nuclear power."

Answer 1 (continued): S. Rep. No. 1325, 88th Cong., 2nd Sess., reprinted in 1964 U.S. Code Cong. and Ad. News, 3109, 3121-3122.

In response to an Atomic Energy Commission (AEC) proposal to establish prices on the basis of hypothetical prices in a non-existent domestic commercial enrichment industry, Congress adopted the current version of section 161.v. which provides that prices for enrichment services "shall be on a basis of recovery of the Government's costs over a reasonable period of time." Pub. L. 91-560, Sec. 8 (1970 Amendment). The 1970 Amendment expressed Congressional misgivings over the establishment of enrichment prices significantly higher than the Government's actual costs which, at best, gave minimal consideration to the other objectives of the AEA. The JCAE Report on the 1970 Amendment emphasizes the change was a clarification to implement the intent of Congress when it originally enacted section 161.v. and thus preserved DOE's considerable flexibility to determine the most effective means to determine and recover the Government's "appropriate" costs and carry out its responsibilities under the AEA. (H. Rep. No. 91-1470, 91st Cong., 2nd Sess., reprinted in 1970 U.S. Code and Ad. News, 4981, 5002-5003, 5012).

Answer 1 (continued): DOE has recently completed discussions with the Office of Management and Budget (OMB) on the Government investment in the Department's Uranium Enrichment Program, the costs to be recovered, and the terms and schedule for recovery. DOE has advised the OMB of the Department's position as follows:

1. The outstanding Government investment should be recovered in a manner that does not damage the Nation's uranium enrichment capability.

2. The uranium enrichment services and pricing structure should be competitive.

3. The recovery plan recognizes both the competitive nature of the international uranium enrichment market and the compelling national mandate for reduction of the Federal deficit.

4. The recovery plan recognizes the need for institutional restructuring of the Nation's uranium enrichment services, to include private sector involvement. Initial efforts will focus on the viability of transferring to the private sector responsibility for Atomic Vapor Laser Isotope Separation (AVLIS) research, demonstration, and

Answer 1 (continued): deployment, with the objective that all new enrichment capacity be financed totally by the private sector.

The following is a tabulation of Government investment derived from a draft financial statement for FY 1985.

Asset	Gross Outstanding Government Investment ($ in Millions)
Plant & Equipment	
Gaseous Diffusion Plants	$ 2,225*
Gas Centrifuge Plant	2,589
Inventory	
Feed	404
Separative Work	1,663
Cumulative Loss	779
Working Capital	(87)
Total	$ 7,573

* Does not reflect $1.2 billion reduction in FY 1984 Financial Statement.

The gross outstanding investment is reduced to $3,481 million, by an amount equivalent to 60 percent of the GDP's that are no longer an earning asset and the entire GCEP, which never was and never will be an earning asset. These assets are not being used to provide enrichment services for the benefit of commercial customers. In addition, the outstanding investment is also reduced by amounts equal to imputed interest charges after these assets

Answer 1 (continued): were deemed to be "non-earning." Therefore, the Government cost to be recovered by the uranium enrichment program can be derived as follows:

	($ in Millions)
Gross Outstanding Government Investment	$7,573
Less: 60% of GDP investment	1,200
GDP imputed interest	193
GCEP investment	2,589
GCEP imputed interest	110
Equals: Unrecovered Government Cost Allocated to Servicing Customers	$3,481

The imputed interest on the unrecovered Government investment made prior to October 1, 1985, will no longer be determined by applying the average rate of Treasury borrowings for the current year. Rather, imputed interest on unrecovered investment made prior to October 1, 1985, will be computed at an interest rate of 6.319 percent--the average of Treasury rates applicable in the years in which net increases in Government investment occurred, weighted by the dollar amount of these annual increases.

The DOE repayment proposal and the determination of the enrichment program's unrecovered costs are included within a Notice of Proposed Rulemaking issued by the Department on

Answer 1
(continued): January 29, 1986, which proposes modifications in the criteria under which DOE offers enrichment services. In the course of the rulemaking proceedings, interested parties will have an opportunity to comment on the terms of the repayment agreement. In addition, the final rule will be submitted to cognizant Congressional committees for a 45-day review period.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 2: What is the basis for the Department's position that only "appropriate" costs need to be recovered? What criteria were used to determine whether costs were "appropriate" or not?

Answer: The Uranium Enrichment Services Criteria in effect since 1979 state: "DOE's charges for enriching services will be established on a basis that will assure the recovery of *appropriate* Government costs projected over a reasonable period of time. The cost of separative work includes electric power and all other costs, direct and indirect, of *operating* the enrichment plants; *appropriate* depreciation of said plants; and a factor to cover applicable costs of process development, DOE administration and other Government support functions, and imputed interest on investment in plant, working capital, and natural uranium contained in those inventories at the DOE enrichment plants needed to provide enrichment services." 44 Fed. Reg. 28875 (May 17, 1979) (Emphasis added).

The costs which DOE determined as not being appropriate costs to be recovered relate to 60 percent of the GDP's that are no longer earning assets and to the entire costs of GCEP which never was and never will be an earning asset. By "non-earning" we mean that assets are not being used to provide

Answer 2 (continued): enrichment services and are not recoverable in the competitive enrichment services market.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 3: DOE reasons that only forty percent of the cost of the Gaseous Diffusion Plants should be recovered since only forty percent of the plant's capacity is used in providing enrichment services. If, at some future date, DOE uses more than forty percent of the capacity of the Gaseous Diffusion Plants, will the Department recover more than forty percent of the cost of that capacity? If not, why not?

Answer: DOE foresees little, if any, prospect of higher demands on the GDP's because of anticipated replacement of the GDP's by the AVLIS process in the 1990's and the lead times associated with growth in nuclear powerplant construction. DOE does not believe that demand will increase over current projections and believes that $1.2 billion of the net book value of the GDP's is not recoverable in the marketplace. Currently, about 28 percent of the GDP capacity is being utilized.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 4: Are continuing reductions in the price of DOE's enrichment service justifiable in light of the write-off of more than half of the program's unrecovered debt?

Answer: Continued reductions in the DOE price are necessary for DOE to maintain a reasonable sales base as current DOE prices are still considerably higher than prices being offered by our competitors. Continued price reductions are necessary for DOE to maintain a sufficient sales base to enable recovery of the $3.5 billion in prior unrecovered costs of the enrichment program. As was explained earlier, we believe our pricing actions are consistent with the Atomic Energy Act and also will maximize revenues to the Government.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 5: To what extent have the recent price reductions succeeded in recapturing part of either the domestic or foreign market for enrichment services?

Answer: It is felt that DOE's efforts in reducing enrichment prices have proven to be beneficial in securing a greater portion of both the domestic and foreign market for enrichment services. The market response to DOE's pricing actions has resulted in an increased market share for enrichment services, with an increase in DOE's share of the world market from 46 to 53 percent between FY 1985 and FY 1990. DOE's share of the domestic market increased from 76 percent in FY 1985 to 95 percent in FY 1990. The foreign market share has decreased from 29 percent in FY 1985 to 26 percent in FY 1990 primarily due to increased European reliance on their own enrichment facilities.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 6: What is the basis for treating the Utility Services enrichment contracts as still in force despite the federal court decision declaring them null and void?

What effect would implementation of the proposed changes to the enrichment criteria have on the federal court decision?

Answer: By Amended Order dated September 19, 1986, the District Court granted plaintiffs Motion for Summary Judgment (Count II) and ruled that the standard form utilities service contract was null and void. The Court concluded that the contract amounted to a change in the enrichment services criteria, and, further, such contract was not submitted to Congress. The DOE filed its Notice of Appeal on September 25, 1985.

Despite the judgment of the District Court, the individual contracts with the utility customers remain valid. The Court, in issuing a declaratory judgment, did not enjoin DOE from providing enriching services pursuant to the contract. Indeed, the individually negotiated contracts between DOE and its customers were not before the Court.

On January 29, 1986, DOE issued a Notice of Proposed Rulemaking to modify the criteria under which it provides enrichment services (51 Fed. Reg. 3624). Among the various changes that the proposed new criteria make, the conflicts

Answer 6 (continued):	that the District Court perceived between the Utility Services contract and DOE's enrichment services criteria will be eliminated. Thus, when the pending rulemaking is complete, the question now before the U.S. Court of Appeals will become moot. It is the Government's position that the adoption of revised criteria will moot the legal issues now before the Court of Appeals. DOE anticipates proceeding with this revision of the criteria independent of further progress in this litigation.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 7: What do you perceive to be the primary purpose of the Department's enrichment enterprises--to serve the nation's nuclear nonproliferation goals' to provide a service to U.S. utilities; or to preserve the domestic uranium mining and milling industry?

In view of the fact that DOE's foreign competitors have captured about 60 percent of the foreign market for enrichment services, does the enrichment program provide any leverage to further U.S. nonproliferation goals at this time?

Answer: The primary objective of the U.S. enrichment enterprise is to meet its contractual delivery commitments to domestic and foreign commercial customers and Government users in an economic, efficient and reliable manner, and to conduct business in a way to assure recovery of the costs associated with its enrichment operations over a reasonable period of time. These basic goals stem from the Atomic Energy Act. In addition, the Act requires that the Department not enrich foreign uranium, intended for use in a domestic nuclear reactor, to the extent necessary to assure the maintenance of a viable domestic uranium industry. A reliable and competitive enrichment industry in the United States also contributes to domestic energy security, improvement in the nation's economy, the furtherance of U.S. nonproliferation policies and balance of trade with foreign nations, particularly the Far East. A viable enrichment capability in

Answer 7 (continued): the U.S. is also necessary to meet national security objectives for Government users.

Despite the reduction in the U.S. foreign market share for enrichment, continued supply of material to foreign nations is viewed as having a positive influence in U.S./foreign relations and providing a positive impetus in gaining acceptance of U.S. nonproliferation policies abroad.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 8:	Is the Department's agreement with the Office of Management and Budget on the amount of unrecovered costs that are to repaid committed to writing? If so, please submit for the record.
Answer:	DOE has completed discussions with OMB on the amount of unrecovered costs that are to be repaid. A memorandum to OMB is being prepared to state the DOE position and to request OMB concurrences.

AVAILABLE

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Privatization of the Enrichment Enterprise

Question 9: What is the status of DOE efforts to convince the private sector to fund and build the first Atomic Vapor Laser Isotope Separation (AVLIS) enrichment plant?

Answer: DOE is in the process of developing a request for expressions of interest to identify potential industrial and financial participants and the terms and conditions they would require in order to undertake AVLIS R&D and commercialization.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Privatization of the Enrichment Enterprise

Question 10: What, if any, financial incentives or assurances will the Federal Government be expected to offer to attract private sector participation?

Answer: The Department will be unable to answer this question until potential private sector participants have specified their requirements for undertaking AVLIS. While we anticipate that industry will request some guarantees and incentives, we do not wish to prejudge or influence the responses we will be soliciting.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Privatization of the Enrichment Enterprise

Question 11: What impact would the private sector's unwillingness to assume financial responsibility for AVLIS have on the viability of DOE's enrichment program? Would DOE proceed with development of AVLIS itself if the private sector does not?

Answer: The long-term competitiveness of DOE's enrichment program depends on deploying AVLIS technology when the costs of operating current gaseous diffusion plants (the largest cost component being electricity rates) pushes DOE's price out of the competitive range.

We do not expect this to happen before the mid-to-late 1990's. In the event the private sector does not proceed with the development and deployment of AVLIS, DOE would reevaluate proceeding with this effort and other options for assuring an economic supply of enrichment services in the future.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Uranium Enrichment

Question 12: What steps would be taken to safeguard our nuclear non-proliferation interests if the AVLIS program is privatized?

Answer: In the near-term, we believe a privately-owned AVLIS development program can be pursued within existing Government policies and procedures to protect U.S. non-proliferation interests. If AVLIS proceeds as a private venture with demonstrations leading to deployment, the Government would take steps to assure that U.S. non-proliferation interests continue to be safeguarded. These Governmental actions would result from coordination among several agencies, including the DOE, Commerce Department, State Department, ACDA, and the Nuclear Regulatory Commission in the areas of classification of sensitive technology, licensing, facility safeguards, security, and export control.

Intra-Governmental activities would be coordinated with AVLIS demonstration and deployment activities following transfer to the private-sector to assure that key aspects of this complex problem are identified and addressed. At this time, it is premature to develop detailed plans for safeguarding nuclear non-proliferation interests if AVLIS is privatized.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Domestic Uranium Industry

Question 13: What actions has the Department taken since the Secretary determined that the domestic uranium mining and milling industry is non-viable?

To what extent has the industry improved as a result of those actions?

Answer: The Department will continue to monitor closely the domestic uranium producing industry. We will also examine ways of increasing the requirements for domestic natural uranium. For example, in September of last year the Secretary announced that a free Variable Tails Assay Option (VTAO) to utilities who purchase all of their requirements under the Utility Services (US) contract. Free VTAO will stimulate increased natural uranium usage since the economically optimum tails assay will increase as a result. We expect that the domestic holders of the US contract would increase their requirements up to about 2 million pounds of uranium concentrate per year as a result of electing this option.

In addition, as a result of our enrichment contracting actions, inventories in the hands of utilities will be worked off, which will bring the supply and demand of natural uranium into balance. It should be noted that the exchange

Answer 13 (continued): value for natural uranium has increased steadily over the last year by about 20 percent.

Since free VTAO was only announced in September of 1985, it is too early to determine the exact extent to which it will increase the use of natural uranium. We will also continue to work to strengthen the underlying structure of the domestic nuclear industry, which should assist the domestic uranium industry.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Domestic Uranium Industry

Question 14: What is the basis for your conclusion that restrictions on foreign uranium will not help the domestic industry?

Answer: Import restrictions would have undesirable effects on both the U.S. uranium industry and the DOE enrichment business. A sweeping limitation would likely cause many of DOE's customers to terminate their enrichment contracts with DOE since lower cost uranium and enrichment services can be purchased from foreign sources. Many of these customers currently may be paying a premium for the reliability they expect from dealing with the U.S. enrichment enterprise. The uncertainty about the future costs of nuclear fuel engendered by an import embargo would diminish their willingness to pay such a premium and thus increase the likelihood they might seek enrichment services from abroad. Information available to DOE suggests that for a uranium price difference of as little as ten dollars per pound, a U.S. utility could cancel its DOE enrichment contract immediately, pay the termination fee, buy enrichment services overseas, and save money. Lost sales resulting from such terminations could reach $300 million annually by 1988.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Domestic Uranium Industry

Question 15: What part of the domestic uranium market is uncommitted and available for capture by foreign uranium suppliers?

Answer: Based on the Energy Information Administration's latest uranium industry survey (from DOE/EIA-0458(84)), the unfilled uranium requirements reported by domestic utilities for their reactors in operation, under construction, or on order are:

Year	Millions of Pounds U308
1986	2.4
1987	6.8
1988	10.3
1989	14.0
1990	16.1
1991	18.4
1992	22.4
1993	24.8
1994	26.8

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

TVA Contract

Question 16: What options has the Department considered to reduce its obligation to pay the Tennessee Valley Authority for unused electricity? What are the roadblocks preventing an elimination or reduction of this obligation?

Answer: DOE executed the original contracts with the Tennessee Valley Authority (TVA) in 1967. The contracts obligated TVA to provide and DOE to take varying amounts of electricity during the term of the contracts. The annual power levels were established based on DOE's existing enrichment contracts with foreign and domestic customers. TVA requires an 8-year leadtime to change the contract levels for any given year. The Department has had excess (unused) power under contract since FY 1981 due to slippages in contracts for uranium enrichment services and terminations by its customers. Current planning shows this excess TVA power under contract existing through FY 1992. Through FY 1985, DOE has paid $826 million to TVA for unused power. Estimated payments for FY 1986 through FY 1992 are about $1.8 billion, for an 11-year total of about $2.6 billion for unused power.

Answer 16 (continued):

Unsuccessful attempts to obtain relief from the TVA capacity charges have been underway since 1981. Items which have been considered include:

- Outright relief from the capacity charges.
- Resale of TVA power by DOE and/or purchase of power from other utilities by DOE.
- Utilization by DOE of seasonal and/or unfirm power from TVA.
- Near-term relief in exchange for additional contractual arrangements beyond the terms of the current power contracts.
- Bartering of goods and services.

To date, no solution to the excess power under contract problem has been found. There are essentially two roadblocks to a solution: (1) TVA's stated belief that resale of the excess DOE contract demand is in violation of the TVA Act; and (2) any reduction in DOE's obligations would increase the obligations of the other TVA customers. The Department believes it has explored essentially all the feasible solutions to this problem, but our evaluation is continuing.

One option, which DOE has utilized, is to exercise its contractual right to cancel, with an 8-year notice, contract

Answer 16 (continued): demand. Since December 1981, DOE has cancelled 4,000 megawatts of its total TVA contract demand of 4,485 megawatts. These cancellations, in 1,000 megawatt blocks, begin in December 1989 and end in December 1992. DOE is now studying the benefits of cancelling all or a portion of the remaining 485 megawatts. These cancellations have reduced DOE's contract obligations for capacity charges over the life of the contracts by about $900 million.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Uranium Mill Tailings Cleanup

Question 17: When do you expect to complete the cleanup of uranium mill tailings sites? What effect will Gramm-Rudman have on the timely completion of this program?

Answer: The Department is confident that there are no technical constraints to completing the Uranium Mill Tailings Remedial Action Project by the end of FY 1993 with the funding requested in our budget request and our planned funding profile for future years.

In preparing the FY 1987 budget request, DOE examined the probability of meeting the currently authorized March 1990 schedule deadline. Experience led us to conclude that a very low probability existed for meeting the 1990 completion date. It was determined that the date could not be met in a cost-effective manner and schedule risks would be inordinately high, especially for the Colorado sites. Also, the annual funding requirements needed to meet the 1990 completion date would be excessively high. Therefore, the Department is requesting a 3-1/2 year schedule extension to reduce the annual funding requirements and assure that all remedial action and processing site certification and licensing activities will be complete by the end of the project authorization period.

Answer 17
(continued):

Gramm-Rudman-Hollings reductions for FY 1986 and initial estimates for FY 1987 have been accommodated within the extended schedule. We are just now beginning a detailed analysis for the FY 1988 budget submission on the probable schedule impacts of Public Law 99-177. It is conceivable, but not planned, that these impacts for FY 1988 or future years could push the project completion date beyond 1993.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Price-Anderson

Question 18: What impact on the Department's operations would you expect from adoption of proposals allowing the federal government to recover Price-Anderson indemnification payments from any contractors or subcontractor that may have been responsible for an accident arising from a contract activity?

Would adoption of such a proposal improve the safety consciousness of DOE contractors and their subcontractors and suppliers?

Answer: One of the purposes of the Price-Anderson Act is to encourage private industry participation in our nuclear programs. A principal way to ensure contractor participation is to indemnify them from liability arising from a nuclear incident that may occur while conducting our programs. Proposals relative to the Federal Government recovering Price-Anderson indemnification payments have included such legally imprecise terms as gross negligence, willful misconduct, or bad faith on the part of our contractors. These terms lead to uncertainty on the part of our contractors and, if adopted, could result in the possibility of their withdrawal from participation since they would feel that their financial exposure would be too great.

Based on a 1983 survey of the major DOE contractors, all felt that the present Price-Anderson system was essential for them to carry out their contract function.

Answer 18 (continued): Of major importance are the small subcontractors who, if subject to recovery of indemnification payments by the Federal Government, could have their total assets in jeopardy. They may, therefore, decide not to remain as subcontractors, thus impacting the ability of contractors to obtain required goods and services.

For those firms wishing to remain as contractors or subcontractors to the Federal Government, they would most likely attempt to purchase insurance up to the present Price-Anderson limit of $500 million. Although not directly comparable, the private insurance carried by nuclear utilities is $160 million for each site and, according to American Nuclear Insurers (ANI), premiums for this insurance range from $300,000 to $800,000 per year depending on the reactor, its location, and a number of other factors. Assuming an average premium of $500,000 for $160 million of coverage and an extension of the $160 million to the current DOE Price-Anderson limit of $500 million, the "average" premium could increase to about $1.6 million per contractor. If the 45 government prime contractors could obtain the $500 million of coverage, the result could thus be a total premium cost to the Government of approximately $70 million per year. The availability of this coverage would be in

Answer 18 (continued): addition to existing commercial capacity. It is unclear whether the insurance industry would be willing to absorb this substantial increase in nuclear liability. Extending this coverage to subcontractors would complicate the capacity issue even further. Even if subcontractors could obtain such insurance, the costs would be passed to the contractor and ultimately to the Government.

Although the contractor is not ultimately financially responsible for third-party claims resulting from a nuclear accident, the contractor is responsible for safety actions based on stringent requirements placed on the contractor by the Government that are directed towards preventing an accident. In addition, financial incentives designed to make the contractors accountable for their actions already exist to assure that facilities are operated safely. These incentives generally focus on the amount of award fee and affect continuation of the contract. DOE decisions in this regard subsequently affect the compensation and careers of contractor management. Based on past experience, the lack of financial responsibility for third-party liability claims has not made a contractor less concerned about the safety of nuclear facilities. Additionally, the contractors responsibility for safety extends to all goods and services supplied to him by subcontractors. As noted above, the

Answer 18 (continued):	financial incentives directed towards contractor accountability assure that he maintains control over the safety-related aspects of subcontractor activities.

POST-HEARING QUESTIONS AND ANSWERS
RELATING TO THE
FEBRUARY 7, 1986 HEARING
BEFORE THE
HOUSE COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT

WITNESS: BEN C. RUSCHE
DIRECTOR, OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

QUESTIONS FROM CONGRESSMAN UDALL

MONITORED RETRIEVABLE STORAGE

Question 1: What impact will the February 5, 1986 decision of the U.S. District Court for the Middle District of Tennessee have on submittal of the MRS proposal to Congress as required by the Nuclear Waste Policy Act?

Answer: On February 5, the U.S. District Court for the Middle District of Tennessee issued a declaratory judgment that the Department had not consulted and cooperated with Tennessee during siting as required by the NWPA. This judgment was followed on February 7, by an injunction from the same court which permanently enjoins the Department "from making any proposal to Congress or filing any documents with Congress which rely on siting studies..." already completed. The specific proposal for an MRS facility mandated in Section 141(b) of the Nuclear Waste Policy Act was scheduled to be provided to the Congress in early February, along with comments received by the Department from the Nuclear Regulatory Commission, the Environmental Protection Agency and the potential host State. The review draft of the proposal and supporting documentation was made available to the State, Congress and other interested parties in December 1985. The final proposal, its required supporting documentation, and the comments from the State and other federal agencies are ready for submission to the Congress, but the District Court injunction prevents the Department from submitting the documents. The Department has appealed to the Court of Appeals for the Sixth Circuit. Submittal of the proposal to Congress will depend on the schedule and content of the circuit court ruling.

QUESTIONS FROM CONGRESSMAN UDALL

MONITORED RETRIEVABLE STORAGE

Question 2: DOE is proposing that the Congress limit the MRS storage capacity to 15,000 metric tons of spent nuclear fuel. This is approximately the amount of spent fuel generated in 5 years by 100 reactors. How did DOE arrive at this specific capacity limit? What is the basis for limiting storage capacity to this amount?

Answer: The 15,000 MTU capacity limit that will be proposed for the MRS is based on projected spent fuel acceptance rates for the MRS and the first repository with some allowance for waste management system contingencies. Assuming the MRS and the first repository meet presently proposed schedules and begin operations in 1996 and 1998, respectively, at their planned acceptance rates, the amount of storage needed at the MRS to accommodate the difference between MRS and repository acceptance rates would be 11,150 MTU. The remaining 3,850 MTU of storage capacity available would provide between one and two years of contingency storage, should there be changes in the repository emplacement schedule. Alternatively, the 15,000 tons does approximate the amount of fuel generated by 100 reactors in five years, as noted in the question.

QUESTIONS FROM CONGRESSMAN UDALL

MONITORED RETRIEVABLE STORAGE

Question 3: Under the proposed system including an MRS, spent fuel from Western reactors will be shipped directly to the repository rather than first to the MRS. If MRS funding comes from the Nuclear Waste Fund, as is proposed, Western reactors will be paying for the MRS even though their spent fuel is not shipped there. What provisions, if any, will be made to accommodate those reactors which are paying for the MRS through their contributions to the Fund but whose spent fuel will not be shipped there?

Answer: The MRS, as an integral waste system element, provides benefits and adds costs to the overall Federal nuclear waste system. The MRS accelerates and increases overall system acceptance rates during the early years when the waste system first becomes operational. This benefits the utilities.

Recognizing that the benefits in timely waste systems development and implementation accrue to all utilities, it is appropriate and equitable that funding for the MRS will come from the Nuclear Waste Fund. Funds paid into the Nuclear Waste Fund from Western reactors should be used for the MRS, just as funds paid from other reactors will go for the MRS. In essence, in considering the overall integrated waste system, if the MRS allows the Federal system to accomplish its mission, to accept and dispose of spent fuel more effectively, the entire system benefits. Although the more likely procedure would see Western reactors shipping directly to the repository for logistical efficiency, the MRS could be utilized as needed for all reactors to meet contractual obligations.

QUESTIONS FROM CONGRESSMAN UDALL

MONITORED RETRIEVABLE STORAGE

Question 4: In its normal operating mode, will *all* of the spent fuel transported directly to the MRS facility--spent fuel from Eastern reactors--be stored on-site for some period of time or will much of this spent fuel be processed, packaged and transported to the repository without being stored at the MRS? If not all spent fuel shipped to the MRS will be stored there, is there an inconsistency between DOE's proposed funding plan whereby *all* utilities will pay for the MRS--regardless of whether their spent fuel is stored at the facility--and the requirements of the act that the cost of the MRS will be borne by those whose spent fuel is *stored* there?

Answer: We currently expect all Eastern fuel to pass through the MRS facility for pre-disposal packaging operations. Only a fraction of this fuel will be stored for any appreciable length of time at the MRS before being shipped to the repository. In addition, any Western fuel for which MRS is the only available means of meeting contract obligations could also be received. After the repository is placed in operation, operational efficiency and logistics would be the basis for setting the point of receipt.

The NWPA requires that the MRS proposal shall include "...a plan for the funding of the construction and operation of such facilities, which plan shall provide that the costs of such activities shall be borne by the generators and owners of the high-level radioactive waste and spent nuclear fuel to be stored in such facilities." The NWPA also establishes "...a separate fund, to be known as the Nuclear Waste Fund"..."for purposes of...the identification, development, licensing, construction, operation...of any...monitored retrievable storage facility constructed under this Act."

The proposed approach of financing the MRS facility through the Nuclear Waste Fund is administratively simple and conforms with the philosophy and provisions of the NWPA. Furthermore, the MRS facility confers benefits directly or indirectly to all contributors to the Nuclear Waste Fund through improvements in waste management system development, deployment, integration and performance, and through provision of a cost-effective capability to accommodate potential repository schedule changes and to meet contractually required receipt schedules.

QUESTIONS FROM CONGRESSMAN UDALL

MONITORED RETRIEVABLE STORAGE

Question 5: What sites other than the three proposed sites in Tennessee were considered? How would the value of the MRS be changed if the MRS were located somewhere other than Oak Ridge, Tennessee?

Answer: Because of the February 7, 1986, District Court order enjoining the Department from filing any documents with Congress that rely on siting studies developed prior to consultation and cooperation with the State of Tennessee, the Department is precluded from responding to this siting related question.

QUESTIONS FROM CHAIRMAN MORRIS K. UDALL

Low-Level Waste

Question 6: Please provide for the record a summary of your efforts to fulfill your responsibilities under the Low-Level Radioactive Waste Policy Amendments Act of 1985.

Answer: The Low-Level Radioactive Waste Policy Amendments Act of 1985 (Public Law 99-240) assigns several new responsibilities to the Department of Energy (DOE). These include responsibility for disposal of "greater-than-Class C" commercial low-level waste; management of an interest-bearing escrow account to rebate to unsited States and regions 25 percent of disposal fee surcharges where those States or regions meet certain developmental milestones; and the allocation of up to 800,000 cubic feet of disposal capacity among the three commercially-operated disposal sites for low-level radioactive waste generated by utilities as a result of unusual or unexpected operating, maintenance, repair, or safety activities.

In addition, DOE is required to prepare several reports for Congress, including (1) a report due in January 1987 on how it will ensure the safe disposal of greater-than-Class C low-level waste; (2) an annual report on the progress of States and compact regions (a) in developing new disposal capacity; (b) the practices of industry to manage, store, treat, ship and reduce in volume low-level radioactive waste; and

Answer 6 (continued): (c) projections for storage and disposal requirements for the following year; and (3) a report on how applicable States and regions expended the rebates from the escrow account of 25 percent of the disposal fee surcharges.

Finally, the Department is to provide assistance to States and compact regions to help them in developing new disposal facilities.

In FY 1986, the Department will establish the escrow account and develop procedures for (1) providing the appropriate disbursements to unsited States and regions or to the disposal site host States should the required milestones not be accomplished; and (2) allocating the 800,000 cubic feet of disposal capacity for utility-generated wastes from unusual or unexpected operating, maintenance, repair, or safety activities. The "greater-than-Class C" low-level waste study will be conducted and the report to Congress is scheduled to be completed January 15, 1987. The report on the expenditure of the escrow account funds will also be submitted to Congress in FY 1987. In FY 1987, the annual report required by Public Law 99-240 will provide an account of the progress States and regions made in 1986 to develop new disposal facilities and information about low-level waste shipped to disposal sites.

Answer 6
(continued):

Finally, the Department has not requested any funds to provide any new financial assistance to States or regions in FY 1987. The Department feels that Federal support of State and regional disposal facility development should be limited to the provision of information, technical assistance and the evaluation of improved technologies for treating, packaging and disposing of low-level waste. Technical assistance will be restricted to providing technical information from within the Department's system of personnel and national laboratories. This technical information will be available to help States and compact regions plan and conduct each required phase of low-level waste disposal facility development according to the milestone requirements in the Act.

DOE believes that since the disposal of low-level waste is the responsibility of the States, those States who want increased Federal Government assistance should be prepared to reimburse the Federal Government for any expanded role. There are a number of mechanisms by which States and compact regions may be able to raise funds to develop low-level waste disposal sites without relying on the Federal Government for further direct financial support. In separating the responsibilities of the States and the Federal Government, it would appear that the language of the Act also would

Answer 6 (continued): encourage the States and compact regions to develop financially independent means for their low-level waste management activities.

RESEARCH ON SUBSEABED DISPOSAL

Question 7: What conclusions can be drawn as to the feasibility of the permanent subseabed disposal of radioactive waste based upon research conducted to date? What impact will termination of this research have on international research programs in this area? How much additional funding would be necessary to complete the current research program?

Answer: At the present time, no definitive conclusion can be drawn regarding the feasibility of subseabed disposal as a permanent option for high-level nuclear waste. A concept feasibility report was planned for issuance in the 1990 time period. Because not all the information required for a definitive evaluation of the technical and environmental feasibility of subseabed disposal has been acquired, such a definitive evaluation is not possible at this time. The value of a feasibility assessment will depend upon the accuracy and completeness of the data used in the assessment and the degree to which the models supporting the assessment have been validated. None of the investigations to date have revealed any insurmountable obstacles to technical and environmental feasibility; however, to confirm these early results, significant additional research is required. Because the position taken to date has been to determine technical and environmental feasibility prior to addressing institutional feasibility, insufficient information is available to assess to what degree certain institutional issues (e.g. the siting of a port in the U.S. to receive, package, and offload the waste to ships and the difficulty in licensing a nuclear facility through international regulatory bodies) may impair the practical feasibility of this concept.

It is not entirely clear what impact termination of the subseabed disposal program will have on international research in this area. With the removal of U.S. participation, the conduct of the research will be impaired. It is likely that the Seabed Working Group will attempt a preliminary evaluation of concept feasibility based on available data, even if it is not a definitive assessment.

Prior to the budget reductions in FY 86, the U.S. cost of program activities required to support a conclusion on concept feasibility in 1990 was estimated to be approximately $90 million. If program funding was resumed at some later date, the total program cost and the time required to reach concept feasibility assessment would likely increase.

AVAILABLE

CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
WASHINGTON, D.C. 20515

SAM GEJDENSON
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[illegible]

[illegible]
FOREIGN AFFAIRS
INTERIOR

February 7, 1986

James W. Vaughan
Acting Assistant Secretary for Nuclear Energy
U.S. Department of Energy
1000 Independence Ave. SW
Washington D.C. 20585

Dear Mr. Vaughan:

During the House Interior Energy and Environment Subcommittee hearing on the Department of Energy FY 1987 Budget Request I expressed my concern that the $11 million "Enhanced Reactor Safety" program proposed in the FY 87 budget was unnecessary because identical research is already being conducted by the Nuclear Regulatory Commission (NRC). I would appreciate it if you could respond in detail to the following questions I have about the proposed program:

1. How much of the $11 million would be devoted to analysis of the data from the Loss-of-Fluid Test Program? How much staff time would be devoted to this analysis (in Full Time Equivalents)? Why is this analysis necessary?

2. How does the proposed Enhanced Reactor Safety program differ from the regulatory research being conducted by the NRC? Please provide a detailed side-by-side comparison of the Enhanced Reactor Safety program and similar research conducted by the NRC.

3. Will the Enhanced Reactor Safety program be conducted at the same location that the Loss-of-Fluid Test program and the Extended Burnup program were conducted? Will the same staff be involved?

I look forward to your response.

Sincerely,

Sam Gejdenson

SAM GEJDENSON
Member of Congress

[illegible] OFFICE:
[illegible]

NORWICH OFFICE:
[illegible]

MIDDLETOWN OFFICE:
[illegible]

[illegible]

Department of Energy
Washington, D.C. 20585

March 4, 1986

Honorable Sam Gejdenson
House of Representatives
Washington, D.C. 20515

Dear Mr. Gejdenson:

Your letter of February 7, 1986, raised several questions concerning the Department's Enhanced Reactor Safety and Loss-of-Fluid Test activities identified in our FY 1987 budget request relative to research and development for improved light water reactors. Answers to these questions are enclosed.

Regarding the interface between Nuclear Regulatory Commission (NRC) and Department of Energy (DOE) reactor safety research and development programs, DOE and NRC staffs meet periodically to coordinate their respective activities so there are no program overlaps, and we require our contractors to do the same. In addition, both DOE and NRC are usually represented on advisory and management groups of programs of mutual interest, and the results from all programmatic activities are closely shared. Historically, DOE has conducted independent technical review of safety matters to support licensing and regulatory policy. In addition, the Department has oversight safety responsibilities for DOE nuclear facilities.

I hope these answers are responsive to your request for information on these activities. We will be pleased to provide any additional information you may require.

Sincerely,

James W Vaughan, Jr

James W. Vaughan, Jr.
Acting Assistant Secretary
for Nuclear Energy

3 Enclosures

QUESTIONS FROM REPRESENTATIVE SAM GEJDENSON

Question 1: How much of the $11 million would be devoted to analysis of the data from the Loss-of-Fluid Test Program? How much staff time would be devoted to this analysis (in Full Time Equivalents)? Why is this analysis necessary?

Answer: The Loss-of-Fluid Test (LOFT) Program is an international project funded by ten countries under the auspices of the Organization for Economic Cooperation and Development (OECD). The original LOFT project is scheduled to terminate at the end of FY 1986, in which case no staff time would be devoted to work in FY 1987. However, because of the success of the final fission product experiment of this international program that produced a large, severely damaged fuel bundle, the LOFT Management Board is considering a follow-on activity for post-irradiation analysis of this bundle. Both the Department of Energy (DOE) and the Nuclear Regulatory Commission (NRC) support the need for this additional work. If such a program is undertaken, the program would be extended in the form of a severe fuel damage program through FY 1988. The total estimated cost of this program is $3.85 million for bundle examination, analysis, and reporting, of which the U.S. share is estimated at $1.3 million. The DOE share in FY 1987 would be approximately $600,000. If this work proceeds, three contractor FTE's supported by DOE funds would be devoted to

Answer 1 (continued): this analytical effort during FY 1987. This work would provide information needed to help close issues in the area of severe accidents and related source terms. The NRC is extremely interested in the data that is expected to result, but does not plan to contribute additional funds to the LOFT program.

QUESTIONS FROM REPRESENTATIVE SAM GEJDENSON

Question 2:	How does the proposed Enhanced Reactor Safety program differ from the regulatory research being conducted by the NRC? Please provide a detailed side-by-side comparison of the Enhanced Reactor Safety program and similar research conducted by the NRC.
Answer:	The NRC regulatory research program is aimed at aiding the development of licensing criteria, providing its staff with the capability to audit submissions from applicants in support of license applications, and providing an independent base of physical data, engineering, and scientific computer codes to substantiate the technical basis for licensing. The program supports no research to assist development of designs and design features.

The Department's programs are generally oriented towards new safety systems and technologies and much of it is done as a coordinated and joint activity with industry efforts and the Electric Power Research Institute. Consequently, the NRC and DOE programs are complementary and both are necessary.

(A comparison of the NRC and DOE programs follow.)

COMPARISON OF R&D PROGRAMS

NRC BUDGET CATEGORY	DOE LWR TASKS	COMMENTS
Reactor Engineering	None	
Thermal Hydraulics Transients	None	
Accident Evaluations	Severe Accident Technology	DOE's program covers TMI-2 core examination, post-irradiation examination (PIE) of severe fuel damage tests, aerosol experiments, and severe accident assessment of advanced LWR concepts. NRC programs focus more on code development, hydrogen experiments, and severe fuel damage testing.
Reactor Operations & Risk	Accident Management	DOE program very small related to role the operator can play in minimizing accidents in advanced LWR's and to examining possible changes to regulatory process based on risk techniques.
Waste Management, Earth Sciences & Health	None	
Operating Reactor Inspection, Maintenance & Repair	Plant Life Extension	NRC program focused more on aging to assure safety of continued operation. DOE--in cooperation with industry--is focused on developing the technical and procedural bases for life and license extension.
None	Advanced LWR	Major area of emphasis for DOE LWR programs. Activity includes innovations to improve safety margins; means of reducing need for regulatory review or oversight by simplification or elimination of systems and inclusion of more passive safety features; and means to improve construction quality, costs, and schedules.

QUESTIONS FROM REPRESENTATIVE SAM GEJDENSON

Question 3: Will the Enhanced Reactor Safety program be conducted at the same location that the Loss-of-Fluid Test (LOFT) program and the Extended Burnup program were conducted? Will the same staff be involved?

Answer: The Enhanced Reactor Safety program will be conducted at a number of government laboratory and commercial sites around the country. Some of the Light Water Reactor program will be conducted at the Idaho Nuclear Engineering Laboratory where the LOFT program was conducted.

Whether employees presently assigned to perform work associated with the Extended Fuel Burnup and LOFT projects are subsequently assigned to the Enhanced Reactor Safety program is a matter for the contractor to determine.